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ORIGINAL LECTURES.

PARALYSIS OF THE TRIFACIAL NERVE, INVOLVING THE INFERIOR AND SUPERIOR MAXILLARY BRANCHES—SPINAL IRRITATION.

A Clinical Lecture
Delivered at the Rush Medical College, Chicago, Ill.

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GENTLEMEN: We have before us to-day a patient who complains of loss of sensation in the right half of the face, with the exception of a small part around the angle of the jaw. We touch him in various parts of the face with the æsthesiometer and find no evidence of tactile or of pain sense. On moving the jaw as in mastication, you will notice that on the right side of the face the muscles concerned in mastication do not move to the extent that they do on the left side. This, then, is a case of paralysis of the inferior and superior maxillary and ophthalmic branches of the trifacial nerve, involving the sensory and the motor functions.

On smelling this bottle of vinegar you see he does not recognize the substance. There is, therefore, an impairment of the sense of smell. This results not from the trifacial nerve being a nerve of smell, but from the fact that it is the nerve which presides over the nutrition of the nasal mucous membrane, and by examining this membrane you will find that it is very dry. Its nutrition is impaired because of the paralysis of the trifacial nerve.

In order to test his sense of taste, we have here *bitters*, *sweets*, and *sours*. The bitters are tasted by the posterior part of the tongue; sweets by the anterior, and sours by the sides. Applying these three kinds of material to the sides of the tongue, we find that on the right there is no recognition of any of them.

The sense of taste can also be tested by electricity. We have here an electrode, the points of which can be brought close together. I will fix them at a distance of about one-fourth of an inch, and will put into the circuit two cells of the galvanic battery and apply the electrode to various parts of the tongue. You see that on the right side there is no appreciation of the galvanic current, but that on the left there is.

There is no conjunctivitis, no disease of the skin, nor any impairment of its nutrition. This, then, is a case of paralysis of the trifacial nerve, with the unusual features of involvement of both the sensory and motor functions of the nerve in all three of the branches. Paralysis of the trifacial involving a single branch is not very uncommon. The trifacial nerve is frequently the seat of neuralgia, the opposite condition to that which we find here. Neuralgia of the inferior maxillary nerve is toothache. Neuralgia of the superior maxillary branch gives us toothache of the upper jaw. Neuralgia of the ophthalmic branch of the nerve in its supra-orbital distribution is brow ague, a form of neuralgia that is very common.

Having made the diagnosis of the disease it is necessary to determine its seat, and for this purpose we must look for associated phenomena. As all the functions of the fifth nerve are involved in this case, the seat of the disease must be either at the Gasserian ganglion, at the base of the brain, or at the centres within the medulla. Now, if the disease were in the medulla, we should have associated with the paralysis disease of the nerves that supply the eyeball, because these cranial nerves in their origin and the first part of their course are in close and intimate relation with the fifth nerve. But in this case we observe that all the movements of the eyeball are well performed, so that the lesion cannot be in the pons, and there is no involvement of any other part of the body; that is, no paralysis of the arm or the leg which would reasonably be the case if the lesion was located in the pons. The lesion cannot be exterior to the ganglion of Gasser, because the three divisions of the nerve are involved, so that the probability is that the disease is located at the Gasserian ganglion.

The next point to determine is the cause of the condition. The probability is that it is syphilitic, and that it is either a disease of the bone or of the membrane. The man tells us that the affection was gradual in its development. It is probable, therefore, that it is a tumor which, by gradual growth, has encroached upon the nerve, making pressure, first upon the inferior division, then upon the middle, and finally upon the ophthalmic branch. An inflammatory disturbance might produce the same results, but it would be more apt to involve the entire structure of the ganglion at once. It would not be so gradual in its development as he tells us this was.

The treatment in this case must be by large doses of the iodide of potassium. The system will tolerate large doses of the iodide of potassium if it is administered in an alkaline solution. We will begin with 10 or 15 grains, increasing, if possible, to 40, 50, or even 60 grains, pushing it to the utmost extent that the patient's digestive system will tolerate.

Then the paralyzed side should be treated by galvanism, stimulating by means of this current the several branches of the nerve, the negative pole being placed at the back of the neck and the positive over the three several branches. The skin of the paralyzed side should be stimulated by the application of the faradic brush or a dry sponge electrode. It will be well also to guard this alterative treatment by the use of tonics—iron, quinine, and strychnine—in addition to the iodide of potassium.

SPINAL IRRITATION.

This female patient is twenty-eight years of age, married, has had one child, now three years old, who

during lactation was seriously sick and caused her mother much anxiety. She complains now of headache; pains of an uncertain character throughout the body; depression of spirits; palpitation of the heart; feels weak and tired; and you notice that she has a peculiar respiration, frequently giving a deep sigh. She says she has considerable distress after eating, and that her bowels are constipated.

We find, upon examining over her spine, that there are certain points of tenderness; pressure in the cervical region produces a considerable amount of pain throughout the entire cervical region and in the lumbar region. Listening over her neck with the stethoscope we hear the anæmic murmur, a peculiar roaring sound, which is an evidence of anæmia, poverty of the blood, and especially of a deficiency of iron. You notice, notwithstanding this anæmic murmur is so pronounced, that she looks fairly well nourished. In amount of adipose tissue, she is far above the average; so that we may have in a person who is fatter than usual marked anæmia.

Now, this is a case of spinal irritation, especially of the cervical portion of the cord, and the headache, the sighing respiration, the palpitation of the heart, the indigestion, the depression of spirits, have their origin in this depressed condition of the cervical cord, which contains the mechanism by which the blood-supply of the brain is in part regulated, and if this regulating apparatus is out of order, the functions of the brain must be disturbed. There is also a close connection with the pneumogastric nerve, the nerve that regulates to a certain extent the action of the heart, and which is the great nerve of respiration. Upon examining her pulse we find it 115 per minute.

The tenderness in the upper lumbar portion of the spinal cord gives rise also to the symptoms of which she complains—derangement of the menstrual function, irregularity and pain, a certain amount of leucorrhœa, and a variable condition of the urinary function.

The causes that produced this spinal irritation were lactation, anxiety of mind, and the attention that the sick child required.

We will order for this patient Blaud's mass, a combination of the sulphate of iron and the carbonate of potash, giving it in gradually increasing doses beginning with 2½ grains of each, and increasing the dose to at least three times this amount. We will also administer this mild laxative pill: aloin, $\frac{1}{3}$th of a grain; strychnia, $\frac{1}{60}$th of a grain; extract of belladonna, $\frac{1}{3}$th of a grain, every night at bedtime. And we will also direct general galvanization, passing a current of one to three milliampères through the head, the positive pole in front; a current of about the same intensity through the neck, the negative pole in front; and a current of four or five milliampères through the spine, the negative pole being over the epigastrium, and will direct her to take the most nutritious food that she is capable of digesting.

Mechanical Treatment of Pleurisy.—DR. RICHARD OTTO asserts that pleurisy in an early stage can often be aborted, and that the symptoms of pain can always be diminished by a bandage passed tightly around the chest at the level of the painful area.—*Centralblatt für Therapie*, November, 1889.

CARTWRIGHT LECTURES.

Delivered before the Association of the Alumni of the College of Physicians and Surgeons, New York, November 21, 1889.

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LECTURE II.

ON VITAL AND MEDICAL STATISTICS.

THE term "expectation of life" is used by different writers in different senses, and hence has often given rise to confusion and misunderstanding. It should be used only in the sense of the mean after-lifetime—that is, the average number of years which persons at any given age, in a given place, may expect to live. In a stationary population, where there is no migration, and where the births are exactly equal in number to the deaths, the expectation of life at any age would be found by dividing the sum of the number of years which the whole population lived after that age by the number actually living at that age.

The term "expectation of life" is often confused with the "probable duration of life," which is the age at which a certain number of newborn children will be reduced one-half, so that for any one of these children it is an equal chance as to whether it will die before or after that age. The difference between the probable duration of life and the expectation of life may be understood from the following example: Suppose that of 100 children born, 30 live one year, 20 live five years, 30 live forty years, and 20 live sixty years. Then the probable duration of life is five years, because at the end of five years just one-half of these children will be dead; so that at the beginning it is an even chance for any one child as to whether it will die before or after the age of five years. But the expectation of life of any one of these children is 25.3 years, because these 100 children will, in all, live 25,300 years of life. In like manner, if 10 of these children were to die at the end of every five years, the probable duration of life would be 25 years, and the expectation of life would be 27.5.

Another phrase sometimes used in vital statistics is "specific intensity of life." This is the quotient of the dividend of the number of persons living at any age by the number dying at that age—that is, $\frac{Px}{Dx}$, being the reverse of the ordinary mortality ratio.

The chief source of error in an approximate life table constructed directly from the census figures and a registration of deaths, without correction or adjustment, is due to the fact that there is a very considerable error in the number given of the living population in the first six or seven years of life. Usually the census figures show that the number of children two years old is greater than the number one year old, and that the number four years old is greater than the number two years old, owing to a tendency to report erroneously a child at these ages as being older than it is. If we undertake to adjust or correct these figures so as truly to represent the number living at each year, we usually have to make some assumptions as to the law governing the mortality, or as to what is sometimes called the "law of life." This expression—the law of life—refers to the

hypothesis that variations in mortality at successive ages take place in regular succession which may be geometrically represented by a curve, and that, therefore, if we know the mortality at certain ages in a given community, we can, if we know this curve, and if the number of observations were sufficient, deduce the mortality at other ages. Numerous formulas have been proposed for this purpose, from that of De Moivre in 1727, which is $Y = 86 - x$, x being the age and Y the corresponding number of the living, to the latest and most generally accepted formula of Gompertz, as modified by Mr. Makeham. This last is based on the assumption that a person's power of resisting death decreases as his years increase, so that at the end of infinitely small periods of time he loses infinitely small portions of his remaining power to resist destruction, death being considered as the consequence of two generally existing causes—the one a progressive, necessary deterioration, the other chance. If, for instance, there were a number of diseases to which young and old were equally liable and which were equally destructive at any age, the number of deaths among the young and the old by such diseases would evidently be in the proportion of the number of the young to that of the old. If there were no other causes of death but these diseases, the number of living and dying would decrease in a geometrical progression as the age increases. But if the liability to death is constantly increasing in a given ratio as the man grows older, then the number of the living will decrease in a greater ratio than a geometrical progression would indicate.

This line of human life—which in some respects is not unlike the line in the palm of the human hand, which the ancient teachers of cheiroscopy also called the line of life—is that of the healthy and normal individual. Many persons do not at any time possess the amount of vital force which it represents; many infants at birth have but the capacity for a few hours or a few days of existence. Some men begin to grow old at forty; the atheromatous degeneration invades their arteries, the heart becomes fatty, and at fifty they are in extreme old age as regards the processes of retrograde metamorphosis and the ability to resist death. Calculations and corrections based on such formulæ as these give interesting results and are useful to life-insurance work, but they are unnecessary to the purposes of the sanitary statistician. Even the fundamental hypothesis upon which Gompertz's law is based—that the proportion of deaths at a given age is constant—is always untrue for any given age, as the prevalence of infectious and contagious diseases of various kinds, and of various lethality, varies with different years; and for this reason it is desirable to have the records of deaths for a considerable period of time—at least three years, and, better, ten to twenty years—in order to correct these variations.

It is impossible to calculate a life table for the United States as a whole, for we have no accurate information as to the total number of deaths occurring in any given period of time in the United States, and still less as to the number of deaths occurring at each group of ages. But even if such a table could be prepared, it would be of very little interest or use, for the conditions of the various sections of the country as to climate, occupations, prevailing diseases, character of inhabitants, etc., are so widely diverse that the average or mean would scarcely be applicable anywhere. The most useful life tables for sanitary purposes are those which relate to certain circumscribed localities, such as a single city, or even a single ward of a city; but for scientific and medical purposes the most useful are those which relate to particular classes of people, particular occupations, etc. There is a special difficulty in preparing an accurate life table for a city, due to the effect of migration into and out of the city from and to the surrounding country, which disturbs very much the rates of death at different ages. The mortality in a great city is almost always reported as less than that which the actually existing causes of death and disease tend to produce, because domestic servants, shop-girls, and others who have come from the country, go back to their rural homes when their health begins to fail after a year or two of city life, and there die. This is especially the case in regard to deaths from consumption and diseases of that class. The groups of ages which are thus specially affected are those between fifteen and twenty-five years; and, therefore, the mortality at this group of ages in the large cities, as calculated from the number of deaths, is too small to represent properly the causes of death acting on the population at those ages. On the other hand, the mortality at the same ages in the rural districts near the city will be correspondingly unduly increased.

The data necessary for the construction of life tables are comparatively rarely available for the purposes of the sanitarian. Hence, while admitting that these furnish the only true measure of public health, registrars of vital statistics and sanitarians have sought for other standards for such measurement, the data for which could be more readily obtained and more easily applied. Especially has the search been made for some means of measuring sanitary conditions and progress from the data furnished by deaths alone, without reference to population. One of the most common of these is the use of the period of infancy from 0 to 5 years, by comparing the number of deaths at this period with the total number of deaths. It is very certain that the period of infancy gives the most sensitive test of sanitary conditions; but the comparison must be made, not with the total number of deaths at all ages, but with the number of the living population furnishing such deaths.

Another method, which we can only use for a census year, is the use of the ratio which exists between the total number of births during the year and the number dying during the year out of this number of births. This is not the same as taking the total number of those dying under one year of age. For example, in the city of Brooklyn during the last census year there were 8805 births, and of these 1408 died, leaving on the date of the census 7397 living children under one year of age, putting aside the effects of migration; but the total number of deaths of white male children under one year of age in Brooklyn was 2059; hence, 159.9 per 1000 of those born within the year died within the year, while the deaths of children under one year were 278.4 per 1000 living at the end of the year, with a still higher rate for the year.

The test of sanitary condition which is most generally

employed in this country is the proportion of the number of deaths which occur in children under five years of age to the whole number of deaths reported. This does fairly well in comparing the rates of the same city, in which it may be presumed that the general ratio of age distribution is nearly uniform at different times, but it is a very fallacious method of comparing rates of different cities or localities.

Much the same may be said of comparison of deaths at a given age-group to total number of deaths, which is apt to give very misleading conclusions. For example, suppose in a given city the total number of deaths of children under five years of age was 30 per cent. of the total deaths, while in a given class of people in the same city they were only 10 per cent. of the total deaths. It would be by no means safe to infer that this special class was in a better sanitary condition, because among the poorer classes the proportion of children is always relatively large, which implies a large population exposed to these special diseases, and, consequently, a larger number of deaths under five years of age, without reference to the sanitary condition.

Another test which has been proposed is that of the mean age at death, which is the quotient of the sum of the ages of different individuals at death, divided by the total number of deaths. This is only useful in comparing the conditions of two populations when the age and sex constitutions of these populations are the same. It is out of the question to apply the test to different occupations, as, for example, to compare the mean age at death of major-generals with that of second lieutenants. The chief use of this test is in its application to different causes of death, but even for this purpose the death-rate in relation to population is much better.

A considerable part of the errors to which one is liable in comparing the mean age of different occupations at death may be avoided by excluding from the computation all deaths of children under five years of age.

Although the expectation of life, or mean after-lifetime, is the standard of comparison almost universally accepted by statisticians, it is, in some respects, not a very satisfactory one, since it is often misunderstood by the public, which is apt to use the word "mean" in the sense of usual or ordinary—that which occurs most frequently. But the ordinary lifetime, or, as Bertillon calls it, the *vie normal*, is a very different matter. After the perils of childhood are passed the greatest number of deaths cluster about the age-period of seventy years, and the popular phrase here would be that it was a premature death which occurred in a man under sixty years of age.

The great majority of the mortality statistics prior to the present century are necessarily incorrect and unreliable, because they are based, for the most part, on the data of deaths alone. The deaths can only be taken as a measure of probable duration of life for any community when the births and deaths are equal and there is no migration, a state of matters which must very rarely happen and be of very brief existence.

Among the many expedients which used to be employed for estimating population was that of multiplying the number of living in which one death was supposed to occur, by the number of deaths. That is to say, by guessing at a factor which could only be ascertained by comparing the annual deaths with the number living. Take, for example, the estimates of the population in London made by Graunt in 1662, on the basis of one death occurring out of every 32 living, which made the population to be 403,000. In 1683, Petty, taking the mortality to be 1 to 30 persons living, made the population to be 669,930.

One peculiar thing about this method is, that it is liable to make the population seem the largest at those periods when it was in reality the smallest; for when the number of deaths was unusually large by reason of an epidemic, which would actually lessen the number living, it would show an apparent increase in the population for the same period.

It may, perhaps, be asked why it is, if the nature of the data which are required to make mortality statistics reliable and satisfactory is so well known, that more of them are not provided by the municipal and State officers charged with the registration of vital statistics. For example, New York City has a very perfect system of registration of deaths, which is in competent hands and is well executed. Why, then, has New York City published no separate mortality report since 1883, and why, in the reports which it has published, does it not give the data with minuteness of grouping, so that we might know the number of deaths at each age, of each sex, and of each race and occupation in each ward from each cause of death, instead of giving, as it gave in its last report, the number of deaths from each of a few causes of death for each of a few groups of ages, and separately for each sex, and for natives of the United States, natives of foreign countries, and colored, to which is added a statement of the deaths from zymotic diseases in each ward?

In order to understand the answer to this it is necessary to have a clear conception of the difference in cost of tabulation and publication according to the mode of grouping of the data. If, for example, the deaths are given by 20 groups of ages and by sex and by color for each of the 24 wards, and for the city as a whole, it will require 49 columns to do this. If we make the distinction for, say, 100 different causes of death, allowing 50 lines to the page horizontally, and 20 columns vertically, giving 1000 places per page, we should get all this information for the city on 4 pages; but if we wish to show the number of cases of death from each cause at each group of ages, of each sex and each color in each ward, we shall have to have 2000 columns, which will make about 200 pages. If it be desired to estimate the influence of seasons in connection with all these things, we must have a similar table for each month, or 2400 pages large octavo.

Again, let us suppose that we wish to have the data fully presented in order to estimate the influence of occupation upon health. We will only ask for details of 100 occupations in males. But we should like to know the number of deaths in each of these occupations for each of, say, 10 groups of ages, in each of at least 5 races, in the married and single, in each of 12 months, for each of the 24 wards, for each of, say, 100 different causes of death, giving 288,000,000 possible places, making 288,000 pages large octavo.

It is, of course, out of the question to present the data

in any such detail as this, and it is therefore necessary to make a selection of combinations which will indicate the most interesting relations of the several points under discussion.

It is, however, often very difficult and even impossible to tell precisely what combinations it will be necessary to make to get at the probable explanation of an especially high or low death-rate in a given group; and hence we sometimes have to make a very considerable number of tentative combinations and tabulations, from which we may select only a few as really throwing light on the matter, and therefore as worth publication.

When we have to tabulate data in such a way that the individual items are to be distributed through a thousand columns or more, and each of these to be summed up for different localities, a vast amount of clerical labor is required. For distributing in 1000 spaces the various items assigned in each death certificate, if it be done by the old-fashioned system of tallying on a large sheet, an expert clerk will not be able to tally off more than 1000 records of death per day; so that for, say, 30,000 deaths, which is less than the average number of annual deaths in New York City for the last ten years, it would require the labor of a clerk thirty days to produce a single-page table—about one per cent. of what is needed.

By the use of cards or slips, tallying machines, adding machines and sorting boxes of various kinds, this labor may be much reduced. One of the latest methods of doing this is by the use of cards of a uniform size in which holes punched in certain parts of the card correspond to the various divisions of locality, time of death, sex, age, occupation, cause of death, marital condition, etc. These cards may then be passed through a machine which registers on a series of dials such combinations of the data as the dials may be adjusted for, by means of electrical connections established between a metal plate below and a series of metal rods above, wherever there is a hole in the card.

Death-rates, even when derived from complete and accurate data and compiled in the most satisfactory manner in the form of life tables, necessarily give only an imperfect view of the prevalence of disease in a community, or of the relative amount of disability among the people, requiring extra labor by the productive class, due to the recurrence of sickness. Many forms of disease which render life more or less of a burden, and some of which totally disable the individual from earning his subsistence, seldom or never appear in the registers as a cause of death; while even of those diseases which are reported as causes of a considerable proportion of deaths, we can rarely at present indicate any definite or certain relation between the number of cases of the disease and the number of deaths reported. For example, it is well known to all practising physicians that the mortality varies greatly in different epidemics of such diseases as scarlet fever, measles, smallpox, whooping-cough, yellow fever, etc., the variations appearing to depend principally upon the particular conditions of the environment as to temperature, moisture, winds, density of the population, etc., at the time of the outbreak, and also upon particular conditions of the specific virus or microörganisms causing diseases of this kind.

Take, for example, the spread of yellow fever in Texas and along the Gulf Coast during the year 1867. Here the specific cause of this disease appears to have entered the United States by two distinct routes, one coming from Vera Cruz, Mexico, and the other coming from the usual source, Havana. At that time the United States had a comparatively large number of troops along the southern border of the country, and hence we have a series of returns showing not merely the number of deaths but also the number of cases of sickness from this disease occurring in a given population.

Now, in those places where the disease was of Mexican origin the cases were more fatal than those of Cuban origin, "two out of every five cases of the former dying, while the mortality of the latter was only two out of seven. The ratio of deaths was 400 per 1000 cases for the first of these groups, 284 per 1000 for the second."[1]

For the great majority of diseases it is not possible to obtain statistics as to their prevalence among a general population. The only sources to which we can look for information of this kind are the records of the Army and Navy, of the police force in certain cities, of the employés of railroads, and of the members of certain societies having insurance against sickness. The records of the Army and Navy are especially valuable in this point of view, but they relate only to males of certain groups of ages and of a carefully selected class of population.

In the last United States Census an attempt was made to obtain on the schedules of the living population the number of those who on the first day of June, 1880, were so sick or disabled as to be unable to pursue their ordinary occupations. This was the first attempt of the kind which has been made in this country, but similar attempts were made in two censuses in Ireland, in a census of the Australian Colonies, and in a census of Hungary.

The first examination of the United States schedules seemed to show that the returns of the sick were too imperfect and too inaccurate to permit of drawing any conclusions from them. But subsequently it turned out that they were really more complete than had been supposed, and a sufficient number were compiled for different parts of the country to obtain a fair sample of the general results. This compilation showed that for the total population over fifteen years of age the number found sick out of every 1000 living varied from 7.17 to 22.7 for males, and from 8.1 to 17.5 for females, or about 1⅓ per cent. of males and 1½ per cent. of females. These do not include the blind, deaf and dumb, insane, and idiots, and it is probable that the figures do represent very fairly the different proportions of sickness occurring in males and females and in certain groups of ages at the time the Census was taken, which, it must be remembered, was at a period when there is probably the least amount of sickness and disability among adults.

From the results of data derived from mutual benefit societies in England, it has been estimated that for every case of death in a community there are two persons constantly sick; that is to say, there is an average of two years' sickness to each death, or that, if the annual death-rate is 18 per 1000, the average number constantly sick is about 36 per 1000.

Mr. T. R. Edwards (London *Lancet*, 1835–36, i. p. 855), from the study of a series of returns from friendly

[1] War Department, Surgeon-General's Office, Washington, 1885; Circular No. 1, p. xviii.

assurance societies, claimed that, for large numbers of people, there is a constant ratio of sickness peculiar to each age, and that the duration of each case of sickness at any age is in proportion to the mortality at that age. His theory is that the mortality at any year of age exceeds that of the preceding year by 2.999 per cent., or that the mortality during any decennial interval of age exceeds that of the preceding decennial by one-third part; or that the mortality rate doubles in twenty-three and a half years.

According to his theory, if a physician loses by death double the proportion of patients at the age of forty-three that he does at the age of twenty, the effect of his remedies in each case is the same.

By the Census reports the proportion of sick to 1000 of population of different ages was as follows:

Age.	Males.	Females.
15 to 25	6.9	6.8
25 to 35	8.6	9.7
35 to 45	12.2	11.5
45 to 55	16.8	14.4
55 to 65	25.5	20.4
65 and over . . .	44.5	35.3

This corresponds in a general way to the conclusions of Mr. A. G. Finlayson relative to the amount of sickness in members of friendly societies, printed in 1854.[1]

He found that taking the whole mass of male members of friendly societies from the age of fifteen to that of eighty-five, about five years of sickness occur to each man during this seventy years; but during the period of labor from the commencement of the sixteenth year of age to the close of the sixty-sixth, there are in this fifty-one years but seventy-eight weeks of sickness, or about one and a half weeks per annum; and the sickness occurring from forty-two to sixty-six is almost double that occurring in the first half from fifteen to forty-one. Hence he concludes that the sickness of the first twenty-five years of working life is almost exactly one-half that that of the second twenty-five years. In the class devoted to heavy labor the sickness is almost a year more, or in the proportion of eleven to nine as compared with the sickness undergone in the class engaged in light labor.

It is also to be observed that during the early years of life—say from twenty-one to forty-one—the number of persons withdrawing, or excluded from such societies, is very large, being nearly five times the number of deaths. As the age of the members increases the departures become fewer, because it becomes more of an object to remain connected with the society, since the rate of annual payments is the same for all ages, while the proportion of sickness steadily increases, as we have seen, with advancing age.

Several attempts have been made to induce physicians to keep a record of all the cases they treat, but with very little result, and it is very improbable that anything like complete returns of sickness will ever be obtained for any large body of the civil population. Such registration will always be confined to infectious and spreading diseases; in other words, those which are known or supposed to be preventable. In order to make a registration of this kind of any great practical value it must be continuous and compulsory. The plan of endeavoring to get the medical men of a locality to contribute voluntarily this information, even when accompanied by the offer of the payment of a fee, has produced partial and incomplete results, which become more and more incomplete as time goes on and the first enthusiasm in favor of the new plan dies away.

The various systems of compulsory notification which have been tried are, first, to require the medical attendant only to furnish the returns to the Health Office; second, to require the householder or head of the family to make such returns; third, to require both the doctor and the householder to make such returns; and fourth, to require the doctor to certify to the householder and the latter to notify the health authorities.

On the part of some members of the medical profession, both in Great Britain and in this country, strong objections are urged against compulsory notification of disease, and, especially, against that form which requires the doctor to furnish such notification direct to the sanitary authorities. It is urged that such notification is a violation of professional secrecy; that it leads to concealment of disease and to the refraining from calling in a medical attendant, and that it tends to throw the treatment of such cases into the hands of a lower class of practitioners, who are willing to run the risks of violation of the law, or even to make false returns for the sake of securing an increased practice. There is, however, little difficulty in keeping the information furnished strictly confidential, provided the health officer is a man of tact and discretion, and provided, also, that the press does not insist upon being too inquisitive with regard to matters of this kind.

Any system of compulsary notification, however, which has to be continuously successful, involves two things: First, that the health officer shall not be in any way engaged in, or connected with private practice; so as to do away with all reluctance on the part of general practitioners reporting their private cases.

The second is, that to obtain any benefit from notification, special hospital accommodations for such forms of diseases as are reported must be provided by the community, and there must be a power of compulsory removal of patients to such hospitals in certain cases.

Undoubtedly, valuable statistical data might be obtained by the simple notification alone; but the desire to obtain statistical information will never be accepted as a sufficient ground for legislation requiring compulsory notification.

We hear very much in recent years of the proportion of deaths from zymotic diseases as a test of the salubrity or sanitary condition of a place; but as there is no general agreement as to what is and what is not a zymotic disease, and as the term rests on a theory of causation of disease which is now definitely abandoned, it should no longer be made use of. It is much better to select the mortality from certain forms of disease, and specify these, in order that we may know exactly what we are talking about and be sure that the matters compared between the two localities are the same. English health officers often use the term "seven principal zymotic diseases," by which they mean smallpox, measles, scarlet fever, diphtheria, whooping-cough, typhus fever, and enteric fever. If this is the selection it is not a good one, for it

[1] See Insurance Cyclopædia, vol. v. p. 83.

omits the diarrhœal diseases. Forty years ago, near the commencement of the speculations of Dr. Farr and Mr. Simon as to the causation of disease, nearly all of the contagious diseases were grouped together as zymotic diseases and were supposed to be more or less connected with filth. At present we know that the cleanliness of the surroundings has little or nothing to do with the prevalence of smallpox, measles, scarlet fever, or whooping-cough; so that these, which are typical zymotic diseases, are of very little interest in connection with the question as to local causes of diseases in a place, connected with uncleanliness, and to be remedied by sanitary effort.

Their relative prevalence, and the mortality due to them, are of interest in a totally different connection, and their separation involves an entirely different field of sanitary work. Such diseases as phthisis, diphtheria, and the various forms of diarrhœal disease, including cholera infantum, or the summer diarrhœa of children, of England, are of especial interest as regards the field of local sanitary work in relation to sewerage, drainage, and cleanliness.

The influence of habitation upon death-rates and on the prevalence of certain forms of disease is indicated by statistics given by Dr. Korosi[1] for the city of Buda-Pest, where the deaths are reported with the following classification, viz.:

1. Persons in a habitation where, at most, two persons dwell in one room.
2. Persons dwelling where from two to five persons dwell in one room.
3. Where there are from five to ten in a room.
4. Where there are more than ten in a room.

The first class includes the rich and well-to-do. The others present increasing grades of overcrowding. Of each 10,000 deaths reported, 1,941 belong to the first; 5,759 to the second; 2,167 to the third, and 133 to the fourth; and these ratios may be used to compare with the proportions of deaths from any disease, or group of diseases, as occurring in the different classes.

Comparisons thus made indicate that contagious diseases, with the exception of scarlatina and typhus, are more frequent and more fatal in the crowded houses, and that the same is true of congenital debility and diarrhœa, while tuberculosis and pneumonia do not seem to be specifically influenced by this cause. (?!) As the figures of death in these categories are not comparable with those of the living population, the results have not much value.

Suppose, now, that we are studying the death-rates of a city for a series of years, in order to determine whether its sanitary condition is, upon the whole, improving; whether work which has been done in the way of introducing sewerage, or improved water supply, or special precautions in dealing with contagious diseases, have had an evident good effect, and have produced results which are on the whole satisfactory in proportion to their cost. It is very evident that we must have something more than the mere gross death-rates for the whole population in order to form an intelligent opinion on these points. A gross death-rate may, it is true, give a correct answer to the question as to whether the sanitary condition is improving, but we can never be sure of the correctness of this answer until we have made detailed comparisons of the mortality by age and sex, and of that due to certain great classes of disease.

What has been the influence of modern civilization upon the average duration of human life—upon rate of increase of population—upon the average health and vitality of the races which it has affected? The present population of the world is between 1500 and 1600 millions, of which there are in Europe over 350 millions, and of European stock in other countries 100 millions—in all, say 450 millions, as against 150 millions in 1788. (See Giffen, *Jubilee Volume of Statistics*, 1885, p. 99.)

Evidently the birth- and death-rates now prevailing in Europe and the United States cannot have long continued, for if we suppose a population to double itself only once in a century, a million of people living 1200 years ago would have developed into a population of over 4000 millions by this time.

What, then, is the difference between the expectation of life in New York, at the present day, and that in European cities one, three, five, ten, or twenty centuries ago? This question has been asked in various shapes many times, and many attempts have been made to answer it; the general conclusion being that there has been a very great increase in the average longevity of man in civilized countries not only within the last thousand years, but within the last century. Notwithstanding, it must be confessed that the statistical records bearing on this point are very incomplete, vague and unsatisfactory, and that it is only for the last forty or fifty years that we can speak with anything like scientific precision as to the amount of progress made.

So far as what is termed potential longevity, that is to say, the maximum duration of life possible in an individual of the race, is concerned, there is no evidence that this has changed for at least 2000 years, being, for man, generally taken as 100 years. You will remember the Scriptural declaration that "the years of a man are three score years and ten, and though by reason of strength they be four score years, yet is their strength labor and sorrow;" notwithstanding, there are sufficient records to prove that even in those days the potential longevity of man was as great as it is at present.

But when we come to the average longevity and expectation of life at birth, there is sufficient evidence to indicate that it has increased; but whether this is due to the preservation of more infant lives for a few years although they may still die before the productive period is reached, or to an increase of the number of those who live into and share the working period of life, is still uncertain, for this question can only be settled by comparative life tables, and I have already explained that we have no reliable life tables that are much over fifty years old.

I have already referred to the average duration of life among the better class of Roman citizens, as fixed by Ulpian, being equal to thirty years. Among the oldest data which we possess, from which we can attempt to compare death-rates of past centuries with those of the present, are the reçords[1] of Geneva in Switzerland, which

[1] Korosi: Influence des Habitations sur les Causes des Décès, etc. Paris, 1877.

[1] Malet: Annales d'Hygiène, 1837, vol. xvii. p. 5.

date from 1551. The average annual death-rate per 1000 was as follows:

From 1551 to 1600	40
" 1601 to 1650	37
" 1651 to 1700	35
" 1701 to 1750	33
" 1751 to 1800	29

From 1801 to 1813 the mean duration of life was thirty-six years and six months.

From this, the probable duration of life is given as follows:

Periods.	Probable duration of life.			Proportionate increase.
	Years	Months.	Days.	
End of the 16th century	8	7	20	100
17th century	13	3	16	153
1701 to 1750	27	9	13	321
1751 to 1800	31	3	5	361
1801 to 1813	40	8	0	470
1814 to 1833	45	0	29	521

The figures are not sufficiently full or accurate to justify the conclusion that the probable duration of life in this place has been increased five times in three centuries, but they do indicate a very marked and progressive increase.

In the sixteenth and seventeenth centuries Geneva had a small population, frequently exposed to fatal pestilence, and produced a comparatively large number of infants, of whom but a very small proportion reached the age of puberty. In the early part of the eighteenth century the average mortality of all European countries, taking towns and villages together, is estimated by Sussmilch as 1 in 30, or 27.778 per 1000.

The most important contributions to our knowledge of the increase in the duration of life in recent years is contained in a paper on "The Decline in the English Death-rate," by Noel Humphreys, published in the *Journal of the Statistical Society* in 1883: and in a report by Dr. William Ogle in a supplement to the Forty-fifth Annual Report of the Registrar-General of England, published in 1885.

The conclusions, as based upon English life tables, comparing periods from 1838 to 1854, and from 1871 to 1880, are as follows:

The mean after-lifetime of a male at birth was for the first period 35.91 years, for the second 41.35, showing an average gain of nearly a year and a half. The mean after-lifetime continues longer in the second period than in the first for each year of life until the nineteenth. At the close of the nineteenth year the expectation of life was exactly the same in each period, viz., 40.17 years. From that time onward the after-lifetime is shorter in the recent period than in the older one; that is to say, the individual male in England lives on an average a shorter time after he is nineteen years old than he did forty years ago; but the number of males, out of equal numbers at the start, who survive to live these shorter lives, is very much greater than it was formerly, so that the aggregate life of the whole is considerably increased. The gain is greater in females than in males. Thus, in the first period, the expectation of life in females was 41.85, while in the second period it was 44.62, being a gain of 2.77 years, on an average, for each female. The after-lifetime continues longer in the new period down to the completion of the forty-fifth year, when the expectation of life becomes the same, viz., 24.06.

Taking a million males and a million females the following table shows the additional years gained at each age-group, for each sex, during the recent period:

Age-periods.	Males	Females
0 to 15	255,340	288,226
15 to 25	281,872	339,933
25 to 35	344,906	453,221
35 to 45	310,746	490,471
45 to 55	211,040	474,009
55 to 65	86,920	385,257
65 to 75	10,464	239,617
75 to 85	27,770	82,568
85 and upward	13,451	8,282
Total years gained,	1,439,139	2,777,584

This table plainly shows how erroneous is the conclusion sometimes drawn that because the death-rates have fallen only in the earlier age-periods, while they have risen in the later age-periods, the aggregate gain to the community from the changes is confined to the unproductive years of life. We may fairly take the period which intervenes between twenty-five and sixty-five years of age to be the most valuable part of life, and of the aggregate years saved, 66 per cent. in the case of males and 65 per cent. in the case of females are lived in this period.

The earliest attempt to give vital statistics for the United States is probably a paper by Edward Wigglesworth, published in the *Memoirs of the American Academy of Arts and Sciences*, 1793, vol. ii. page 131, entitled, "A Table showing the probability of the duration, the decrement, and the expectation of life, in the States of Massachusetts and New Hampshire, formed from sixty-two bills of mortality on the files of the American Academy of Arts and Sciences, in the year 1789." The whole number of deaths reported on these bills was 4893. He had no data of population, but the reports indicated that the births in the locality sending the bills were twice as many as the deaths. As his calculations are based solely on the deaths alone at certain ages, the conclusions are evidently entirely unreliable.

Another paper is by J. E. Worcester, printed in the *Memoirs of the American Academy of Arts and Sciences*, Philadelphia, 1833, vol. i., new series, page 1, and entitled "Remarks on longevity and the expectation of life in the United States, relating more particularly to the State of New Hampshire." Taking the bills of mortality of thirty-two townships in New Hampshire, for an average length of time of twenty-one years, he found that the death-rate was 1 in 83, or 12.04 in 1000. He wisely remarks that the ratio is so small as to excite suspicion concerning the accuracy of the bills.

One of the most frequent fallacies in the use of statistical data is to mistake an effect or a coincidence for a cause. For example, it is common to speak of rapid growth in population of a locality or country, as if it were in itself a good and desirable thing, a cause of prosperity and well-being; and when this growth lessens or ceases we find some philosophers trying to devise ways and means to increase it. This, for example, has been the case in France for a number of years, and

various plans have been proposed for increasing the birth-rate and diminishing the death-rate, in order to produce prosperity and strength in the country. The fact is, that rapid increase of population in a country is an indication that things are going on well there; that there is a demand for labor; and that men find that they can increase their comfort by going, or staying, there. But it may, or may not, be a cause of prosperity at a given time, and sometimes it may cause hardship, weakness, and suffering.

You are all, no doubt, familiar with what is known as the Malthusian theory, which is, essentially, that population is limited by the means of subsistence available; that population increases in a geometrical proportion, while the means of subsistence do not increase in a faster ratio than arithmetical progression; that, therefore, the growth of population is checked by want of means of subsistence, and, therefore, that the increase of mankind may be considered as the chief source of misery, which misery, together with moral restraint to a limited extent, and vice, check the superior growth of population, keeping it at a level with the means of subsistence.

If this doctrine be applied to the lower animals, or to an extremely savage and ignorant set of men, it is very nearly correct; for, in this case, the term "means of subsistence" applies almost exclusively to the natural produce of the earth. As soon, however, as man applies his intelligence to the increase of the means of subsistence by improvements in agriculture, by manufactures, etc., it is no longer true that the means of subsistence increase in an arithmetical proportion. They may increase, and for the last fifty years have, throughout civilized regions of the world, actually increased in a ratio more rapid than geometrical proportion, and more rapid than the increase of population; and it is, therefore, substantially true that "the character of every race of men is the real limit to its numbers in the world, if allowance be made for accidents of position and time" (Farr, *Vital Statistics*, London, 1885, p. 15).

The uneducated and unskilled laboring classes, who are without capital, when gathered together in large masses, tend constantly to illustrate the theory of Malthus by increasing faster than they can provide means of subsistence for themselves and their families.

But this tendency is opposed by the advance in knowledge, increase in energy, and improvement in inventions in the educated classes, who, although it may be said that they are acting only from selfish interests, are, nevertheless, led by those interests to expand the fields of agriculture, manufactures, and commerce, and, thus, both to increase the means of subsistence and to lessen the price thereof.

Under favorable conditions a population is capable of doubling its number every 25 years. In the United States, between the years 1790 and 1860, the population doubled itself about once in 23½ years. But a proportion of this increase was due to immigration.[1]

[1] In estimating the progress of the population of the United States for the next century, if we assume a rate of 33.3 per cent. of increase in ten years, which is a little less than the mean rate for the last century, we find that the probable population in 1990 will be 1,206,562,248, giving a density of population of 399 to the square mile, approaching the present density of China, which is 420, or of Belgium, which is 434 per square mile.

Whether in the future a systematic attempt to maintain an equilibrium between subsistence and population will become a practical problem of national policy, is, at present, a purely theoretical speculation, for it is very easy to show, as has been done by Mr. Atkinson, that the means of subsistence at present at our command can easily be quadrupled, as the increase of the population occurs both to require and produce such increase.[1]

One of the most interesting and important questions in vital statistics in this country is that relating to the relative increase in the white and colored population in the Southern States, and the influence which has been, and will be, exerted upon this by the abolition of slavery. On the one hand, it is claimed that the large increase in the colored population between 1870 and 1880 indicates that in fifty, or at most a hundred, years more it will greatly predominate.[2] On the other, it is affirmed that the greater increase of the colored population is apparent rather than real.

We have little information of value relative to the vital statistics of the colored population in the South, previous to the abolition of slavery. The only two Southern States having registration laws which were to any extent enforced were Kentucky and South Carolina. The Kentucky reports relating to the registry and returns of births, marriages, and deaths are eight in number, commencing January 1, 1852, and extending to December 31, 1859, the last report being printed in the early part of 1861. The South Carolina annual reports of registration of births, deaths, and marriages begin with the year 1853 and end with the year 1859. In neither State was the registration of either births or deaths in any year sufficiently complete to permit of accurate comparisons with the number of living population, either for the whites or blacks.

The conclusions drawn by the registrars may be summed up in the statement that the birth-rate of the slaves was much greater than that of the whites in South Carolina, while the difference was not marked in Kentucky; that in both States the death-rate of the negro was decidedly greater than that of the whites, especially in infancy, and that the average age at death was decidedly higher in the whites.

I have already shown the fallacies connected with taking the average age at death as a means of judging either the healthfulness of a locality, or the expectation of life. Notwithstanding, this is practically the only ratio to which we can refer in regard to the question under consideration.

[1] Maria Mitchell, in a recent number of The Century, speaking of an interview with Sir John Herschel, says, that one morning at the breakfast table Herschel put the following question: Suppose that since the time of Cheops, 3000 years ago, man had only died from natural decay at about 90 years of age, and that the population doubled itself every 30 years; starting with a single pair at the time above referred to, would the present surface of the earth afford standing room to the entire progeny, if closely packed? The replies to this conundrum were various—one saying that they would occupy a layer three feet deep, another a layer fifty feet high, and so on, extending the guesses as he said "More, more," to the distance of the moon, to the sun, and, finally, to the planet Neptune; when his reply was, that they would have piled up upon the surface of the earth to a distance equal to a hundred times the distance of the earth from the planet Neptune.

[2] See paper by E. W. Gilliam, Pop. Sci. Monthly, xxii. 433.

The records of the statistics of 1880 show that the birth-rate for the year was greater in colored than in the whites, since in the ten groups in which distinction of color was made for this purpose, the birth-rate for the whites was 32 and for the colored 38.06 per 100 of aggregate population; or, for the whites, 127.1, and for the colored, 163.8 per 1000 of women between the ages of fifteen and forty-nine. The birth-rate is always higher among the poorer classes of a population, and it is doubtful whether the birth-rate of the negro is higher than that of the laboring classes among the whites. The mortality among the colored infants in the earlier months of life is much heavier than among the whites in the same localities. For example, in the ten grand groups just referred to, out of each 1000 infants born, the number which died under six years of age was, for the whites, 66.7, and for the colored, 71.4. This fact tends to increase the birth-rate among the colored, because, with the loss of the infant and the consequent cessation of nursing, the probabilities of a fresh pregnancy increase. The marked difference between the vital statistics of the white and colored in the South is much greater in the cities than in the rural districts.

The average mortality in a population of a little over 43,000,000 whites, was recorded as 14.74 per 1000; while in a population of 6,752,000 colored, the recorded mortality was 17.28 per 1000. It is known that each of these recorded death-rates is much lower than the actual one, owing to failure to record the whole number of deaths occurring during the census year; but it is also known that the proportion of failures to record was decidedly greater among the colored than among the whites, and hence the difference between the death-rates of the two races is even greater than that indicated by these figures.

How far is this excessive mortality in the colored population due to race characteristics? Is it due to peculiar susceptibility on the part of the negro to certain distinctive forms of disease, or to his having less vital force and capacity to resist disease and death? Undoubtedly the great mass of the colored population is poor and ignorant, lives in the dampest and dirtiest parts of cities, and in the midst of unhealthy surroundings, and is in other respects unusually exposed to well-recognized causes of disease.

The statistics of 1880 show that the colored race is peculiarly liable to fatal results from certain forms of disease, especially consumption, pneumonia, diarrhœal diseases, affections of pregnancy, scrofula, and venereal diseases; and that, on the other hand, it is much less liable than the white race to fatal results from cancer, diphtheria, diseases of the nervous system, scarlet fever, and suicide.

Notwithstanding the interest and importance of the question, we have, at present, no sufficient data to determine whether the negro, under the same circumstances as to poverty, etc., is or is not more prolific or short-lived than the whites, and absolutely no data of any value for determining the relative fecundity and mortality of the mixed bloods, including mulattoes, quadroons, octoroons, etc. An effort will be made in the coming census to supply this deficiency as far as possible. In the enumeration of the population, those of mixed blood will be recorded separate from the pure blacks and the pure whites, and an effort will be made to obtain corresponding records of death in order to determine the death-rates of these mixed bloods. An effort will also be made to determine the birth- and death-rates of certain classes of poor and ignorant whites, such as the tenement-house population in our northern cities, as distinguished from those of the mass of the white population, which will give us a better means of comparison of the mortality of the two races, under comparatively similar circumstances, than we now have.[1]

In studying the causes of disease and death in communities, a very important point to be considered is the relative poverty, ease, or luxury in which different parts of the population live, or the sickness and death-rates of so-called social classes.

That extreme poverty, producing inability to obtain the amount of food, clothing, and shelter requisite to preserve health, is a direct cause of high death-rates, especially in northern climates, is known to all; but the extent to which this factor of want influences the death-rates in different countries or communities is by no means easy to determine, and thus far we have, for the most part, only data bearing indirectly upon this subject. For the provident, and presumably well-to-do, classes we have the statistics of life insurance companies; but these are for selected lives, which fact tends to give a low death-rate during the early years of the policy-holders; while, on the other hand, the tendency to cease paying annual dues and to give up the insurance is greater in those who are well and strong than in those who have reason to suspect that they are diseased, so that the death-rates in the greater ages are higher in the insured than in those not insured. We can only draw some inferences from the vital statistics of occupations, from tenement-house statistics, etc.; but it is very difficult to distinguish between effects of density of population, occupation, race, intemperance, uncleanly habits, and actual want of the necessaries of life.

One of the latest systematic attempts to enumerate the population of a city by social classes, and to obtain corresponding reports of deaths so as to give death-rates, is that made in Dublin by Dr. Grimshaw.

In this connection may be mentioned the statistics collected by insurance companies among the Quakers, or Society of Friends, both in England and in this country.

In 1830 Mr. Robert Ranking published a table showing the probability of life among the Society of Friends in the city of Bristol, England.

The superior expectation of life shown in this city led to the establishment of a Friends' Provident Insurance

[1] Dr. Berenger-Feraud, in a note on the fecundity of the mulattoes of Senegal, published in Revue d'Anthropologie, 2d series, vol. ii., 1879, p. 577, gives the details with regard to the offspring of 118 females of mixed blood, and concludes, 1st, that the union of a white man with a negress in Senegal produces children apparently of good health; 2d, the offspring of these mulattoes between themselves, when there is no further intrusion of pure black or white blood in the descent, give children who are usually sterile; 3d, when there is a new addition of white blood after the first generation, the offspring are less vigorous, the number of the girls becomes greater than that of the boys, and the girls are often sterile, with a strong tendency to abortion.

The data are insufficient to bear out any definite conclusions, and the above can properly be put in the form of questions only.

Institution in the following year, due to the belief that the members of this society had a superior longevity; but the parties concerned, with their usual business sagacity, did not invest money on a mere belief. They set to work and collected all the registers of Friends in different parts of the kingdom, with births and deaths, from which a table was prepared showing that at birth the expectation of life was:[1]

At 5 years	. . . .	41.8 years.
" 10 "	. . . .	45.3 "
" 15 "	. . . .	42.1 "
" 20 "	. . . .	39.2 "
" 30 "	. . . .	33.3 "
" 50 "	. . . .	21.2 "
" 60 "	. . . .	14.7 "

The tendency now is to accumulate the best and the worst of the race in the cities. They draw to them the most enterprising, vigorous and prudent, whose tendency is to late marriages and few children, and thus tend after a time to lower the standard of the race. Where the tendency is to replace a feeble and lower race by a better one, there is progress; where the tendency is the reverse, there is decay. The hope that by increased knowledge, charity, and coöperation, the feeble, the sickly, and incompetent can be so cared for that they shall become strong and vigorous, is that held by most men of the present day, but there is nothing in the laws of heredity which gives any foundation for this hope.

What is to be the outcome of this modern civilization? "Its enemies are not without, but within; not savage nations on its borders, but dwellers in its own cities." The general tone of modern European literature is pessimistic as to the future, filled with doubts and fears as to what the coming supreme democracy will do. In this country it is more hopeful, and looks forward to progress in improvement in the physical conditions of the race, though admitting the dangers and difficulties which this very physical improvement tends to produce. But, whatever be the views of individual thinkers and writers, on one point all can agree, and that is as to the desirability of having at our command definite, positive information as to the character, amount, and set of currents of this stream of human life in different countries and localities. An important part of such knowledge is that which relates to the composition of, and changes in, the population in different countries, which is the special field of vital statistics.

ORIGINAL ARTICLES.

DIRECT HERNIOTOMY.

With Reports of Cases.[2]

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DIRECT herniotomy, done with the view of effecting a radical cure, is a subject of such importance that I venture to give a brief abstract of the work of this kind that I have done during the past fourteen months.

The number of cases I offer is small, comprising a total of but ten, in which I did eleven operations. Seven cases occurred in females and three in males. Three were cases of umbilical hernia, three inguinal, and one ventral. Six of the operations were done during strangulation, while five were performed for troublesome, irreducible hernias.

In the six cases of strangulated hernia the sexes were equally represented; three were inguinal, two femoral, and one umbilical. In five of them the operation for radical cure was done; the remaining case was one of strangulated hernia, where stercoraceous vomiting existed for eight hours before it was seen. General peritonitis was evident at the time of the operation. Much blood-stained fluid escaped when the contents of the sac were returned. Death followed in thirty-six hours. I have since thought that if, after returning the contents of the sac, I had done a low median laparotomy and washed out the peritoneal cavity, the result might have been different.

The four cases of irreducible hernia were all in females. Two were umbilical, one femoral, and one ventral. In one of the former a second operation was made necessary by the hernia recurring at the end of six months. The tumor also re-formed at the end of ninety days in the case of femoral hernia. A second operation was not done here, because the patient has been able to get along comfortably with the aid of a truss. The remaining eight cases continue well to the present date. I have already stated that one of the cases died. The patients were aged, respectively, twenty-four, twenty-six, forty, forty-six, forty-eight, fifty, fifty-five, sixty-two, seventy-six, and eighty-four years. In the patient aged eighty-four years the hernia was inguinal and strangulated, and though presenting on the left side, both the cæcum and appendix were found in the sac.

The following is a very brief description of the different procedures practised in the several cases: In each the sac was first cleanly dissected out and not opened until hemorrhage was entirely checked. Both in the ventral and umbilical hernias the integument and fascia were divided by an elliptical incision. After opening the sac all adherent omentum was tied with catgut and excised. The remaining contents were then returned into the cavity. In one case of umbilical hernia the neck of the sac was tied close to the margins of the opening and cut away immediately in front of the ligature. The stump was then fastened tightly in the opening with silkworm-gut sutures, and the wound finally closed by interrupted sutures of the same material. In this case no suppuration occurred, but, as already mentioned, the hernia recurred at the end of six months. In

[1] See Insurance Cyclopedia, vol. v. p. 144; also, table on page 147, comparing expectation of life of Friends with those of the general population, and showing a decidedly higher average for the former.

[2] Read before the Southern Surgical and Gynecological Association, at Nashville, Tenn., November 12, 1889.

both the other umbilical and in the ventral hernias, the neck of the sac was excised on a level with the abdominal opening and sutured with catgut. The opening itself, after its edges were freshened, was closed with the continued suture of chromatized catgut in the ventral hernia and aseptic corded silk in the umbilical cases. The superficial tissues were brought together by silk sutures, which were continued down to the aponeurosis.

In the femoral hernias I adopted the practice of Mr. Mitchell Banks, which consists in freeing the sac up to the crural ring, tying it with strong catgut, and then cutting it away. No attempt was made here to sew up the ring.

In the cases of direct inguinal hernia, after tying the neck of the sac just within the ring, and removing everything in front of the ligature, the ring was closed with catgut sutures.

In the cases of oblique inguinal hernia I did Mr. Ball's operation, which, I hardly need say, consists in freeing the neck of the sac up to the internal opening, ligating it, cutting away everything in front of the ligature, then twisting the neck upon itself to effect closure of the peritoneal orifice, and finally stitching the stump to the pillars of the ring to guard the neck against untwisting itself.

Drainage by tube was secured in one case only. In the remaining operations drainage was effectually accomplished through the lower angle of the wound, this being left open for the purpose. Suppuration proper followed in no case. A small amount of pus, strictly limited to a suture puncture, was observed in two cases only—one an umbilical, the other a ventral tumor.

A detailed description of the several methods now employed for the radical cure of hernia is unnecessary and foreign to the object of this paper. Using the most general terms, however, I may say that in the operations for umbilical and ventral hernias, the difference, in any practical sense, is, after all, but little. Ligation of the neck of the sac, stitching it when excised, plugging the aponeurotic opening with the sac, closing the opening with sutures, really covering the several operations. The suture material itself is somewhat more varied, embracing chromatized catgut, kangaroo tendon, silk, and silver wire.

There is a greater diversity of practice when inguinal and femoral hernias are the subject of operation. Here, in order to close the internal opening, ligatures, sutures, twisting the neck of the sac, and tucking the sac into the orifice are used; while as to the sac itself, it is removed or left undisturbed after dividing it in front of the ligature, or sutured or quilted to the pillars of the external ring. The manner of dealing with the ring also varies. Some surgeons suture it, others leave it without sutures, while others split the entire canal and plug it with iodoform gauze, that it may close by granulation. Of one and all of these procedures it may truly be said that the prime object is to effect adequate closure of the abdominal orifice of the sac, and, by means of the needed plastic material, impart to it the strength and solidity necessary to keep it closed. The operation done and recovery effected, the question of whether the parts should be reinforced by a truss arises; and here again practice varies, some surgeons asserting that the pressure of the truss causes absorption of the inflammatory exudation, and thereby increases the probability of recurrence of the hernia; while others are equally positive that such is not the fact, but that a properly adjusted truss unquestionably tends to prevent the tumor re-forming. In a single word, however, it may be safely said that whatever operation selected, and however skilfully executed, a considerable percentage of relapses occur, and there is no procedure which is wholly devoid of danger.

I will now give an abstract of the several cases to which I have referred in the foregoing:

CASE I.—Mrs. D., aged fifty-five years. Right femoral hernia for ten years. Became strangulated forty-eight hours before I saw her, vomiting from the beginning, and stercoraceous for the past eight hours. Great abdominal distention and tenderness. Temperature 101°; pulse 120; skin clammy. Herniotomy at 1 P.M., June 1, 1889; Drs. Clemmons and Chenowith assisting. Tumor small. Knuckle of intestine completely filled the sac and so adherent as to require great care in its separation. The knuckle, though quite dark in color, was not gangrenous. When it was returned a considerable quantity of reddish fluid escaped from the peritoneal cavity. This led me to leave the neck of the sac open and introduce a rubber drainage-tube into the peritoneal cavity. The vomiting soon ceased, but diarrhœa with copious green stools followed, and death occurred thirty-six hours later.

CASE II.—Mrs. H., aged fifty years, suffered with a left femoral hernia for two years. Never wore a truss. Tumor descended only after violent straining, until now patient had been able to effect reduction without difficulty. Strangulation occurred June 10, 1888—thirty-six hours before I saw her; stercoraceous vomiting for the last six hours of the time. Slight abdominal distention; no tenderness. Temperature normal; pulse 112. On exposing the sac I found the condition of the hernial contents similar to those of the preceding case, though very little fluid escaped from the peritoneal cavity after the return of the hernia. The neck of the sac was ligated close to the femoral ring and the portion in front of the ligature excised. Recovery good. No recurrence up to date. Patient of Dr. Cox, of Cox's Creek, Ky.

CASE III.—Mr. G., aged eighty-four years. Left inguinal hernia for past forty years; always used a truss. Hernia became strangulated June 30, 1888, twelve hours before I saw him. No stercoraceous

vomiting; temperature normal; pulse 78. Contents of sac: cæcum, appendix cæci, and a small knuckle of ileum. Patient still living, with no recurrence. Patient of Drs. Grant and Palmer.

CASE IV.—Mrs. I., aged sixty-three. Umbilical hernia of ten years' standing. Had been strangulated ten hours before I saw her. Contents of sac: intestine and omentum, the latter adherent to the sac. Recovery; no recurrence. Patient of Drs. Grant and Palmer.

CASE V.—Mrs. B., aged fifty-two years. Large irreducible right femoral hernia of five years' standing. The tumor had been increasing in size for two years, and was so painful as to incapacitate her for her household duties. Operated August 15, 1888; recovery. Recurrence of hernia the latter part of the following November. She declined a second operation, but has gotten along comfortably since with the aid of a truss. Patient of Dr. E. L. Pearce.

CASE VI.—Mrs. J., aged fifty-eight years. A small, irreducible umbilical hernia of one year's standing; very sensitive to touch. The patient had colicky pains whenever she attempted any kind of work. Operated December 19, 1888. Contents of hernia: omentum, which was adherent to the sac. Hernia returned eight months after. A second operation on July 3, 1889. No recurrence to date. Assisted by Drs. Pearce and Evans.

CASE VII.—Mr. M., aged twenty-four years, had a small, oblique, inguinal hernia occurring after a violent muscular effort in January, 1889. It was replaced and gave no further trouble until the following March; while he was straining at stool it descended. Three hours after the protrusion occurred he came to the University, being in great pain. He had not vomited. The tumor was about the size of a hen's egg and quite tense. Failing to reduce it under chloroform and aspiration, I operated. The sac contained a small quantity of reddish serum. Immediately after the operation the patient was taken in a conveyance three and a half miles, where he came under the care of another physician, who reported a quick recovery. The further history of the case I do not know.

CASE VIII.—Mrs. T., aged thirty-three years; weight 212 pounds; married, but no children. Had ovariotomy performed in 1883. At the lower end of the cicatrix a small hernial protrusion formed soon after the patient began going about. This steadily increased in size, in spite of many appliances. In April, 1889, the tumor had reached the size of a small cocoanut, and the abdominal cicatrix was stretched almost to the last degree. On April 15, 1889, I did herniotomy. I have previously told how the operation was done. Recovery complete; no recurrence to date. Assisted by Drs. Pearce and Evans.

CASE IX.—Mrs. M., aged sixty. An irreducible, umbilical hernia, of the size of a hen's egg, and of one year's standing; sensitive to touch, and quite painful when the patient did any manual labor. On September 29, 1889, I performed herniotomy. Contents of sac: omentum and knuckle of intestine, the former adherent to the sac. This operation has also been described. Uninterrupted recovery; no recurrence. Assisted by Drs. Pearce and Evans.

CASE X.—Mr. B., aged seventy-six; butcher by occupation. Had to give up business two years ago because of a troublesome right inguinal hernia. The hernia was strangulated in March last, but reduction was accomplished under chloroform six hours before I saw him. October 6, 1889, the hernia became strangulated. A faithful attempt at reduction under chloroform failing, an operation was urged, but declined. The following day the patient decided to have it performed. I did herniotomy forty hours after strangulation set in. Contents of sac: composed of a large knuckle of intestine, which was very deeply congested. There was about one-half an ounce of a reddish fluid and blood-clot in the sac. This operation I have described elsewhere. The patient, because of an enlarged prostate, could only urinate while standing; yet recovery took place without an untoward symptom. He made a quick recovery. No recurrence has yet taken place. Assisted by Drs. Rodman and Howard.

PRELIMINARY OBSERVATIONS ON THE MICRO-ORGANISM OF TEXAS FEVER.[1]

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SOUTHERN cattle fever, or Texas fever, as it is more popularly known, is an infectious disease of the malarial type. The infectious agent, bound to a particular locality, is only temporarily transferred by cattle to places free from permanent infection. During the past summer healthy cattle brought from North Carolina, late in June, infected a small enclosed patch of pasture at the Experiment Station of the Bureau of Animal Industry. Of the native cattle placed in this enclosure at the same time, the first died late in August. Up to the last week in October, ten had succumbed to the fever and two recovered. The territory, even after the Southern cattle had been removed, was still capable of infecting fresh animals placed upon it. There was also a continual increase or accumulation of the virus in the enclosure, for the animals placed on the ground late in the season died after an exposure of but one-half or one-third the period which was necessary to destroy those exposed since early summer. The infection did not spread beyond the enclosure.

The first indication that the disease had entered the system and was there unfolding its destructive activity, was a continuous high temperature fluctuating very slightly and subsiding only when death or recovery ensued. The temperature rose from 101°–102° F., to 106°–107° F., and in the fatal cases remained high from four to fifteen days. After a variable number of days, the high temperature was accompanied by general weakness lasting but a few days, when death ensued. Had it not been for

[1] Read at the Brooklyn Meeting of the American Public Health Association, October 23, 1889.

the thermometer, the early stages of the disease would have remained unnoticed.

A few days before death, the urine became more or less deeply colored with hæmoglobin, and in nine out of ten cases the bladder after death contained deeply tinged urine. In the tenth case, hæmoglobinuria was present three days before death. The destruction of red globules causing this condition could be easily demonstrated by examining blood taken from an incision through the skin. In several cases, on the day before death,[1] the number of red globules had fallen to about one million in a cubic millimetre of blood, the normal being about five million. In one case, now recovered, the corpuscles were reduced in number nearly one-half several days before the temperature fell to normal, and a week later the number had not yet risen to three million. This enormous loss of red globules gave the blood an exceedingly thin, watery appearance.

At the autopsy, beside the condition of the blood as noted, it was found to coagulate rapidly and form clots of unusual firmness. Large clots in the ventricles of one animal which had died during the night cut like liver tissue. The following description of the most obvious lesions will apply with more or less emphasis to all ten cases:

The spleen is enlarged to several times its normal size. When incised, the tense capsule retracts and discloses a dark-red more or less disorganized pulp, occasionally running out as a semi-liquid mass. This engorgement is due chiefly to the presence of an enormous number of red globules. The liver is the seat of considerable disturbance. Its color is a yellowish-brown. The parenchyma is deeply bile-stained, and when examined under the microscope the finest bile canaliculi are found plugged in many cases with consistent, cylindrical masses of bile. We have, in fact, a complete pathological injection of the intra-lobular biliary system. The liver cells show more or less fatty degeneration. The bile in the gall-bladder is usually so thick that it scarcely flows. This is due to the presence of a large amount of solids in the form of minute yellow flakes. There is no obstruction to the flow of bile into the duodenum. The kidneys are in some cases suffused with the color of hæmoglobin, and the connective tissue around them distended with reddish serum. In some cases they are but slightly affected. The small quantity of albumin found in the urine may be accounted for by the hæmoglobin.

Lesions of the fourth stomach and intestines were either absent, or else did not differ much in degree from those observed in healthy cattle. In one case there were superficial ulcers in the fourth stomach. A more or less extensive ecchymosis of the duodenum is occasionally met with, more rarely in the cæcum. In none of the ten cases examined was there any appreciable jaundice.

I am fully aware that these facts, in much greater detail than my experience or my time will allow me to present them, have been before the public since 1868. My reason for bringing them up again is to connect the observations on the etiology to follow with certain definite characters of a definite outbreak, so that there may be no question raised in the future as to the nature of the disease from which the following facts were derived.

In investigations of this nature it is very desirable that all theories which may account for the disease process should be carefully tested. But the quantity of work to be done, if all are to be exploited at the same time, is so great that the work probably would end in a muddle. To the student of Texas fever several theories clamor for attention. First, it would not be out of place to do as some observers have done, and locate the cause of the disease in the organ most affected, such as the liver, and refer the destruction of the blood elements to the reabsorption of bile from that organ. This theory, however, does not seem tenable, because the visible sign of the reabsorption of bile, jaundice, is not constant in Texas fever and did not appear at all in the cases upon which our investigations are based.

If we make the destruction of the red corpuscles the starting-point of our theor , we have two alternatives before us. The specific germ may multiply in the digestive tract and there produce a ptomaine capable of dissolving red corpuscles when absorbed into the circulation. Those who are acquainted with the researches of Stadelmann, and more particularly Afanassiew, in Germany, will see the pertinence of this theory. These observers produced in dogs nearly all the lesions which I have mentioned as characteristic of Texas fever, by feeding varying doses of toluylene-diamine. The absorption of this poison caused rapid destruction of the red corpuscles followed by the injection of the bile canaliculi with thick bile, by jaundice and hæmoglobinuria. The other alternative would assume that the red corpuscles are destroyed by organisms in the blood itself. It will be seen on a little reflection, that to test the truth or falsity of these hypotheses would require diverging lines of research, especially when we bear in mind that there may be disease germs which can only be detected with the microscope.

In order to understand the results obtained from the investigations conducted in the laboratory of the Bureau of Animal Industry, it will be best to give a brief summary of the latter. In the summer of 1886, two spleens taken from animals which had died of Texas fever in Virginia came to the laboratory. Cultures from one gave a variety of bacteria.

[1] Several animals were killed in a dying condition.

From the other all media remained sterile. At the same time the following observations were recorded.

In or on many red corpuscles there are small round bodies, perhaps 1 μ in diameter, centrally or somewhat excentrically situated, which stain poorly in an aqueous solution of methyl-violet, very well in aniline-water methyl-violet. They then resemble micrococci in size and form. Unstained, they can be seen as mere transparent spaces in the corpuscles.

No opportunities were presented for the further study of the disease within reach of the laboratory until the summer of 1888, when an outbreak in Maryland, about fifty miles from Washington, furnished the material. Five cases were found in a condition fit for study, and various organs were taken to the laboratory in refrigerator cans designed especially for such a purpose.

From these, numerous cultures were made on different substrata, while the organisms of the intestinal tract likewise received due attention. In general, cultures from the spleen, kidneys, and urine remained sterile. From the digestive tract were obtained, almost pure, roll and plate cultures of a microbe probably identical with Escherich's *bacterium coli commune*. This organism was occasionally present in the liver and bile and very rarely penetrated into other organs in very small numbers.

During the outbreak studied this summer my time and attention were diverted into another channel. Cultures were made, however, from at least five cases upon such substrata as blood-serum, agar, glycerin agar, and bouillon peptone, with the same negative result. While cultivation demonstrated the absence of bacteria from the blood and internal organs, the microscopic examination was equally fruitless.

The negative outcome of bacteriological work in 1888, combined with a careful study of the pathological changes in the organs which came to the laboratory at that time, led to the inference that the disease must be due to a blood parasite which could only be detected by the microscope. It thus became essential to have the disease within reach of a laboratory, so that the blood could be carefully studied during the course of the disease, and the material from the internal organs obtained absolutely fresh. These conditions were fulfilled in an admirable manner, as you have seen, and the outcome has been the discovery of what we believe to be an organism within the red corpuscles of the blood. The intra-globular bodies observed in 1886 were found in all the ten fatal cases of Texas fever. It might be asked, Why was the organism not found in 1888? I would reply, that, owing to the condition of the material, I could place no reliance upon the studies of the blood elements, which even under the best conditions are very difficult. Hence no attention was paid to this subject, the time being devoted to bacteriological studies. In these days it is necessary first to demonstrate the absence of bacteria before other results are credited. I may say, however, that preparations from one of last year's cases, re-examined a few days ago, showed the intra-globular bodies as distinctly as could be desired, but in numbers too small to be detected by any but the forewarned. The observations thus far made upon the intra-globular bodies may be very briefly summarized.

In fresh spleen pulp they are visible as round or oval, nearly colorless spots from ½ to 2 μ in diameter on the disk of the red corpuscles, and always somewhat excentrically placed. Careful focussing leaves no doubt that they are within the body of the corpuscle. There may be but one, quite commonly two, and very rarely three, or four, in the same corpuscle. In organs kept in the cold for nearly two weeks they were still visible, but faintly, owing to the diffusion of the hæmoglobin around and perhaps into them.

When cover-glass preparations are dried, heated, and stained with the ordinary aniline dyes, these intra-globular bodies stain as readily as nuclei and bacteria, and hold the stain with a similar tenacity.

The smallest forms then appear like deeply stained cocci, about ½ to 1 μ in diameter, situated within the unstained circle of the corpuscle. Occasionally the bodies are nearer 2 μ in diameter, and then the staining may be less dense. Besides the spherical forms, ovoid forms are not uncommon. These usually occur in pairs within the same red corpuscle. A still rarer, pear-shaped form, is encountered in stained preparations of the blood. It is rounded at one pole, while the other is pointed and sometimes drawn out as a short filament. These forms quite invariably occurred in pairs, a corpuscle being occupied by a single pair. I am very much inclined to consider the pair as the result of a division of the single body within the globule. In one instance I saw the tapering ends of a pair apparently continuous. Each body was about 3 μ long; its greatest width, 1.5 μ. These are the largest I have encountered. This same pear-shaped form I have only seen in cover-glass preparations made from blood during life.

That these parasites have the power of changing their form I cannot affirm from direct observation. The following illustration seems to indicate that they may. In one of the animals attacked the disease ran a brief, acute course. It was killed when the rapidly falling temperature and the inability of the animal to rise indicated death before the next morning. The spleen and liver were flooded with the intraglobular bodies. Perhaps every fifth corpuscle contained a pair. Cover-glass preparations, dried at

the autopsy, showed the ovoid bodies very well. The kidney, for want of time, was placed in the cold. Twelve days later it was still in good preservation and preparations made at that time showed a large number of intra-globular bodies in pairs, but round. It is highly probable that they changed their form in the cold.

One other abnormal form found in the blood deserves mention. When dried cover-glass preparations are stained in Loeffler's alkaline methylene-blue, a few red corpuscles appear as if their surfaces had been dusted over with minute specks of coloring matter. Whether they are due to the anæmia, or whether they belong to the cycle of the parasite, remains to be determined experimentally.

As to the relative number of intra-globular bodies in the different organs of the same animal, the ten cases which have come under observation afford some noteworthy facts.

As a rule, there are very few in the circulating blood, whether taken from incisions through the skin before or during the death-agony, or from the heart after death. There are exceptions to this rule, however. In one case they were readily detected in the blood from a skin incision one day before the animal was killed. Blood from the right ventricle showed an enormous number of these bodies, in pairs, within the red globules.

As a rule, then, the circulating blood contains comparatively few parasites. They are filtered out by the spleen and the liver. They may be numerous in one or both of these organs, and practically absent in blood from the right ventricle. They are somewhat more numerous in the spleen than in the liver. This estimate may, however, be erroneous, owing to the larger number of corpuscles in the spleen pulp. I paid but little attention to the blood in the kidney. In two cases in which a very large number of parasites were found in spleen and liver, they were likewise very abundant in the kidneys. The red marrow of the ribs examined in four cases contained none.

There are also a few facts at hand concerning the relative number of parasites in different animals at the time of death. In perhaps one-half of the cases they were so few in number in the spleen that they might have easily escaped the attention of an observer searching for bacteria. In four out of ten cases the organisms were very numerous in spleen and liver, and could not well be overlooked. I found myself able to see them in a thin layer of fresh spleen pulp, with a dry apochromatic objective giving a magnification of not more than 250 diameters. In one case they were so few in number, even in spleen pulp, that a number of fields had to be scanned before any were detected. In this case the spleen was completely disintegrated. The urine, containing much hæmoglobin several days before death, was found of nearly normal color at the autopsy. The animal had evidently overpowered the parasites, but died from the havoc caused by them.

Concerning the transmission of the disease from cattle to other animals, we have only the following experiment to report: Spleen pulp from a steer just killed, and containing very many intra-globular bodies, was stirred up in sterile salt solution, and of this red liquid 1½ cubic centimetres were injected into the ear-vein of each of three rabbits. They remained permanently well.

The question now arises, What is this organism? We have seen it in but two recognizable forms, the sphere of slightly varying diameter, and the oval, pear-like form. I have already said that I believe these to be one and the same form, the latter a stage of division. This may or may not be true. The difficulties surrounding the direct observation of these minute bodies are very great, and we may have to rely upon indirect methods for more information. It might be argued that they belong to embryonic or degenerated red corpuscles. That they do not belong to embryonic forms I have been able to convince myself by examining the red marrow of the ribs, where the production of red corpuscles to take the place of the destroyed ones is very active. That they are not elements of degenerated corpuscles is too evident from what has been stated to require further discussion.

As to the true nature of the organism only conjectures are possible at this stage of the inquiry. It may be a phase in the life history of some of the lowest mycetozoa, such as the monadineæ, or it may belong to the group of sporozoa, some of which are pronounced cell parasites. As to the external characters of the disease, we have still to learn how the southern cattle carry the disease-germs while they themselves are immune, how the germs multiply on the pasture, and how they enter the susceptible organism of northern cattle; and whether or not they are ever eliminated from the diseased body to become a fresh centre of infection. These problems are intimately associated with the life-history of the parasite, and will finally be solved when its life is thoroughly known. They are the most important from an economic standpoint, and their solution will without doubt throw a strong light on human malarial diseases.

I think that we may safely formulate a simple definition of this disease with the aid of the foregoing observations. It is essentially a blood disease. There is a continuous or paroxysmal destruction of red blood-corpuscles due to an intra-globular parasite, and the disease results mainly from the incapacity of the internal organs, primarily the liver, secondarily the spleen and kidneys, to transform and re-

move the waste products resulting from such destruction. In milder cases the protracted anæmia, which results from the loss of corpuscles, may become the chief cause of exhaustion and death, even when the organs remain pervious and capable of carrying on their respective functions.

I have purposely omitted in this brief sketch, to refer to the former investigations of Texas fever. I need simply to say that as far as my own have been carried they contradict the results of those who claim to have found germs which can be readily cultivated. Their claims are just, so far as the finding of germs is concerned, but I do not doubt that they all have a *post-mortem* history, and that the investigators have been hampered by difficulties which it was impossible to overcome. There seems to be nothing which literally breeds bacteria so rapidly as a dead body in midsummer.

In conclusion I wish simply to mention a few facts already on record, bearing directly upon what has been claimed in this paper. In glancing over the very excellent report of Dr. Stiles to the New York State Board of Health, in 1867, I find the following statement:

"The red blood-corpuscles when examined immediately after removal from the body were shrivelled and crenated without artificial provocation. In one case many of the disks appeared to have lost a portion of their substance, as if a circular piece had been punched out, the addition of water failing to restore the disk to completeness."

I am convinced that Dr. Stiles had before him the intra-globular bodies, which must have been very abundant to call forth this statement. His description applies exactly to the appearance which was presented by these bodies in a few cases, more particularly when the bodies were relatively large. At that stage of our knowledge it was entirely excusable for Dr. Stiles to pass these bodies by without further attention.

In Virchow's *Archiv.* for January, 1889, V. Babes describes an enzoötic disease among Roumanian cattle along the banks of the Danube, which he calls epizoötic (*seuchenhafte*) hæmoglobinuria. The disease has many features in common with Texas fever, and many peculiar to itself. Toward the end of his investigations, made in the summer of 1888, Babes settled upon an intra-globular parasite as the probable cause of the disease. This he also found in masses outside of the blood-corpuscles in the œdematous hemorrhagic infiltrations about the kidneys, stomach, and intestines. He describes it as a diplococcus, is able to cultivate it, and produces in rabbits by subcutaneous injection a disease fatal in from 1½ to 2 weeks. Without going into detail, I am inclined to consider this parasite, as described by him, quite different from the one found in Texas fever. The Texas fever organism has thus far failed to multiply in culture media. Its appearance did at no time suggest the characters of bacteria. It has not been found outside of red blood-corpuscles in any appreciable numbers. Inasmuch as both his and our investigations must be regarded as just begun, the future will have to decide how near of kin these two diseases are.

THE TREATMENT OF HYPERTROPHY OF THE LINGUAL TONSIL.

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MUCH attention has been lately called to this condition, its frequent association with grave respiratory neuroses having attracted the notice of many able observers. Pathologically, it consists of an overgrowth of the glandular tissue at the base of the tongue, accompanied by a varicose condition of the neighboring veins. The new-formed tissue appears to be identical in structure with that found in so-called hypertrophy of both the faucial and pharyngeal tonsils, and may be described as hyperplastic adenoid tissue resulting from chronic *lymphadenitis*.

According to Lennox Browne, the cause is to be found in a general or local vaso-motor neurosis, associated, in females, with menorrhagia or amenorrhœa, and in a similar condition the result of alcoholism. The writer has found lingual tonsillitis to be very common in the over-worked and undernourished, and quite frequent in patients in whom the gouty diathesis was markedly present; the immediate cause may be said to be dependent on a low bloodvessel tone, combined with a condition of chronic inflammation of the lymphatic tissue from various causes.

Very diverse and sometimes alarming symptoms have been noted by different writers. Gleitsmann mentions the sensation of a foreign body in the throat, *globus hystericus*, interference with voice, pain radiating from the throat, cough and asthma. Alarming dyspnœa and serious interference with deglutition, leading to profound depression of the general health, have been noted by the present writer and others.

It may be here mentioned that Dickson[1] considers varicosity of the ranine and lingual veins a diagnostic sign of value in relation to hemorrhagic lesions of the brain and cardiac weakness. Varicose veins in this situation are, in my experience, also associated with extreme frequence with "irritable heart" and general "neurasthenia."

The diagnosis of this disease depends on a thorough examination with the laryngeal mirror; the tongue is to be drawn well forward, and the glass

[1] Brit. Med. Journ., May 2, 1885, p. 888.

introduced with its lower edge held more forward than when making an ordinary laryngoscopic examination. Hypertrophy of the circumvallate papillæ, associated with dyspepsia, must not be mistaken for the affection we are considering; the lymphatic tissue is situated below the papillæ, at the very base of the tongue, in the glosso-epiglottic fossa. Greatly dilated vessels of a purple or blue color, and often above two millimetres in diameter, will be found radiating in a fan-like arrangement from the fossa over the base of the tongue, the lingual surface of the epiglottis, and the lateral pharyngeal walls. The hypertrophied lingual tonsil may encroach on the epiglottis to such an extent as seriously to hinder its movements and wholly fill up the epiglottic fossa; the two sides may also be unequally affected, and present the brawny look so characteristic of overgrowth of the *pharyngeal* tonsil. In very marked cases the epiglottis appears to be *imbedded* in the base of the tongue, and pressed backward so as to render laryngoscopy very difficult. In a case lately seen by me it was hard to pass an applicator down between the lingual surface and the epiglottis, even with the tongue drawn forward to its fullest extent. The condition is found generally in adults, and most frequently in women, commonly in individuals of poor physique and nervous temperament, who also suffer from rhinitis of advanced sclerotic type.

The above sketch seems to be a fair exposition of our knowledge of the pathology of this interesting subject; more extended observations as to its etiology are, however, much needed.

The results of *treatment* are very satisfactory, but the successful management of the disease calls for a considerable amount of manipulative care to secure good results. As to constitutional remedies, Delavan has obtained most excellent consequences from the administration of small doses of mercury combined with iodide of potassium; when associated with indigestion, he administered "the old-time mixture of rhubarb and soda." Strychnine, preferably given by hypodermatic injection, is advocated by many, and all writers advise tonics in one or another form. It is my habit to prescribe full doses of ammonium chloride and sodium bromide, five grains of the former and ten of the latter salt, three or four times daily. General faradization, regulated bathing, the use of the "salt towel" and similar frictions, and properly directed open-air exercise, are the best measures at our command for restoring vaso-motor tonus. The condition of the digestion must be carefully looked after, and long hours of rest and sleep should be insisted upon, if satisfactory progress is to be secured.

In a case of lingual tonsillitis lately under my care, in which paroxysmal dyspnœa, great emaciation, and blood-spitting were prominent symptoms, the difficulty of deglutition was so extreme, and the exhaustion so profound, that systematic feeding with fluids only was required for some months, the patient finally recovering perfectly. The administration of solids must be begun with extreme caution in such cases, as a serious attack of spasmodic dyspnœa may follow an unguarded indulgence, and the depressing effect of such a seizure on the patient, both physically and mentally, can scarcely be exaggerated. Fortunately such grave neuroses are but seldom found, and in milder cases it is sufficient to regulate moderately the diet. The great importance of the psychical element in these individuals must be remembered, and the patient's mind set at rest, so far as possible, regarding his condition.

Local treatment can only be properly carried out under the guidance of the laryngeal mirror and with approved apparatus. If the hypertrophied tissue is small in amount, applications of iodine, menthol, and thymol, in alcoholic solution or in glycerine, made directly to the diseased glands by means of a curved applicator or forceps, have an admirable effect in controlling symptoms and decreasing the size of the growth. Menthol—ten to thirty grains per ounce of alcohol and glycerin, equal parts—has been somewhat largely used by the writer in cases of dyspnœa and dysphagia, associated with lingual and faucial tonsillitis, with very gratifying consequences. The applications must be made directly to the diseased areas with great care, as, should the solution enter the larynx, alarming, possibly fatal, laryngeal spasm might result. Personally I prefer a light, curved forceps, in which a well-rounded pellet of cotton, saturated with the medicament, is firmly held; the patient holding his own tongue, the laryngeal mirror is introduced with the left hand, and the application rapidly made, under full inspection, with the right.

If the new growth be more advanced and dense in structure, very guarded applications of chromic acid, made only to a very small area of the hypertrophied tissue, or light touching with the curved galvano-cautery knife, at only a dull-red heat, are advocated. When the mass is of large size Gleitsmann uses his cautery snare, and removes it bodily. Whatever means be employed, the extreme tendency to hemorrhage and reactive inflammation of the organ operated upon should not be forgotten. The impossibility of carrying out antiseptic measures in this locality also adds greatly to the dangers of operative procedure, which should, consequently, never be attempted until all milder measures have been thoroughly tried.

All instruments can be used without pain to the patient under cocaine anæsthesia, repeated pencillings with a five per cent. solution being made at intervals of two or three minutes for some ten min-

utes before the operation. The after-treatment consists of the use of antiseptic and sedative gargles, or, far better, of the employment of similar solutions in the down-curved laryngeal atomizer. The tongue is drawn far forward, the instrument introduced, and the glosso-epiglottic fossa thoroughly washed out; this is also an admirable method of applying medicines to the diseased glands, prior to operative interference, in treating lesser degrees of adenoid overgrowth. Whichever therapeutic measure is adopted, the close relationship between *nasal* and pharyngeal disease must be borne in mind by the surgeon, and careful treatment directed to the nasal cavities must always precede operative steps. Especially are those rhinal conditions accompanied by the trickling of morbid secretions into the lower pharynx apt to be associated with advanced disease of the lingual tonsil, and in many cases the latter condition can be effectually controlled by treatment directed solely to the nares and pharyngeal vault. The well-known relationship of intra-nasal disease to inflammation of the *faucial* tonsils, and its close association with impaired vaso-motor tonus,[1] should be remembered in considering the etiology of lingual tonsillitis. The cause of tonsillar inflammation following nasal disease depends on the function of the tonsils being, in large part, to absorb the unused saliva, together with other faucial and pharyngeal secretions. Morbid and septic products are, of course, absorbed along with those of a normal character, inflammatory changes in the lymphatic tissue resulting. Not infrequently the source of the septic secretion will be found in obscure chronic laryngo-bronchitis of mild type, treatment of which is essential to the improvement of the patient's condition. Ten years ago Cohen noticed that enlargement of the lingual glands was not uncommon in *chronic laryngitis*, and gives an illustration of the condition in his classical work.[2] It is more than probable that the lingual tonsil shares with other "lymphadenoid" tissue the physiological property of absorbing waste secretions, and lingual (as well as faucial and pharyngeal) tonsillitis is best accounted for by so plausible a theory.

Hot vapor inhalations of terebene, creasote, and compound tincture of benzoin, in combination, have a very satisfactory influence in controlling the laryngo-bronchial affection, and, secondarily, the lingual disease. It has certainly been the writer's experience that these cases improve far more rapidly and permanently under the proper local treatment of the nares, pharynx, and laryngo-bronchial mucous membrane, along with the vaso-motor tonic measures, than under any therapeutic means directed only to the local disease or the general anæmia.

The greatly dilated veins so characteristic of the disease we have considered, I regard as symptomatic both of some "central" vaso-motor pathological condition and of the local inflammatory changes, and therefore calling for special direct treatment in rare instances only. In this connection it may be recalled that Browne[1] and others have noted slight enlargement, or at least congestion and sensitiveness to touch, of the *thyroid gland*, and, on palpation, the peculiar thrill of venous congestion, in this class of cases. Varicose veins in other regions of the body are also often present, and are "concurrent evidences of the dyscrasia."

49 N. SEVENTEENTH STREET.

[1] See Intra-nasal Sclerosis: Amer. Journ. Med. Sciences, Feb. 1889.

[2] Diseases of the Throat and Nasal Passages, 2d ed., p. 478.

CLINICAL MEMORANDA.

PATHOLOGICAL.

Sarcomatous Kidneys in an Infant.—On December 16, 1889, I delivered a woman, after great difficulty, of a dead male child, with an enormously distended abdomen, but otherwise well formed. From external examination, the distention was apparently caused by some solid organ or growth. The mother, though small, was well formed and healthy, has one healthy child six years old, personal and family history of mother and father good.

Autopsy: Weight of child twelve pounds. The distended abdomen was found to be due to large kidneys, whose external surfaces resembled fœtal kidneys in being slightly lobulated. One weighed a few grains more, and the other a few grains less than fourteen ounces avoirdupois. They were highly œdematous, and when cut, an inodorous, yellowish serum exuded, and continued to ooze until the organ was reduced to two-thirds of its former bulk. The renal substance was very spongy, and had the appearance of being made up of a reticulum of connective tissue, containing fluid in the interstices; the bladder contained no urine, neither was there any fluid in the pelves of the kidneys. It was not determined whether the ureters were patulous or not. All the other abdominal organs were apparently healthy. I failed to find, after careful and repeated microscopical examination, tubules or Malpighian bodies. Professor A. J. Ochsner, of the Pathological Laboratory of the Rush Medical College, Chicago, to whom one of the bodies was referred, writes: "The tumor is a sarcoma, but sufficient kidney substance is preserved to excrete sodium urate and uric acid crystals, which show in different portions of the section" (which he sent to me).

I. N. Danforth, in an article on "The Evolution of Cystic Kidney" (*Journ. Amer. Med. Assoc.*, October 20, 1888, p. 541), says: "At rare intervals an infant is born, or is instrumentally delivered, with an enormously distended abdomen, due to the fact that the kidney has been converted into a congeries of cysts. . . They are regarded, and probably correctly, as a peculiar form of cystic degeneration of the Malpighian bodies, but occa-

[1] The Throat, etc., 2d ed., p. 208.

casionally the convoluted tubules appear to be involved. . . The process probably begins during intrauterine life. . . The disease usually invades both kidneys."

Virchow claims that the cause is from an inflammation of the straight ducts, an embryonic nephritis. The walls of the ducts adhere, and the urine cannot escape from the kidney.

Roberts says: "Congenital cystic degeneration almost always involves both organs. . . Generally there is more or less increase of connective tissue. . . Occasionally the kidneys present a spongy or cavernous appearance on section, and the cysts are only visible on microscopical examination."

These extracts very plainly describe the conditions present in my case. Owing to the skrinkage of tissues during the hardening and staining process, the section sent me by Professor Ochsner shows the cellular elements very differently from the appearance of a fresh specimen.

I would add that neither during labor nor following the birth of the child did I detect the escape of any amniotic fluid. It was, emphatically, a dry birth. There was an excessive amount of vernix.

E. H. KING, M.D.

WEST LIBERTY, IOWA.

MEDICAL.

Note on the Treatment of Typhoid Fever.—During the past nine years one hundred cases of typhoid fever have been under my care. Doubtful and abortive cases are not included. With the exception of perforation and peritonitis, most of the usual accidents and complications have been observed. Prolonged rest and liquid food were always ordered, but these orders were not always obeyed. A temperature of 104° was nearly always reduced by means of internal antipyretics (quinine or phenacetine) in moderate doses.

Cold baths were not used in any case, and the so-called specific and antiseptic treatments were not attempted. No routine treatment, except the use of antipyretics in cases with a very high temperature, was employed. Violent symptoms were treated by means of the ordinary palliative remedies, and, for the most part, the cases were let alone. Stimulants were used very sparingly, and only in a few of the more serious cases. The rate of mortality was just two per cent.

The two fatal cases were both in very corpulent women, one aged sixty and the other about thirty-five years. The former died of heart failure, and the latter of "the direct severity of the disease" with coma.

From a very careful study of the cases, it seems to me probable that antipyretics carefully used in selected cases are not entirely without value. The results obtained seem to throw grave doubts on the utility of certain special modes of treatment which are advocated with so much noise in certain quarters. It is somewhat doubtful whether the mortality of typhoid fever, as observed in general practice, can be reduced much below two per cent. by means of cold baths, or, for that matter, by any other means.

O. H. MERRILL, M.D.

CORINNA, MAINE.

MEDICAL PROGRESS.

Prescriptions for Dysmenorrhœa.—For the relief of mechanical dysmenorrhœa, PROFESSOR GOODELL recommends the following mixtures:

℞.—Bromide of ammonium	. . .	ʒij.
Bromide of potassium	. . .	ʒiv.
Aromatic spirit of ammonia	. .	fʒvj.
Camphor-water, sufficient to make		fʒvj.—M.

Of this, from a dessertspoonful to a tablespoonful may be given every two or four hours.

℞.—Aromatic spirit of ammonia Spirit of nitrous ether	}	āā fʒj.—M.

From a teaspoonful to a dessertspoonful every two to four hours.

℞.—Chloral	. . . . .	ʒij.
Bromide of potassium	. . .	ʒiv.
Camphor-water	. . . .	fʒvj.—M.

One tablespoonful every two to four hours.

If nerve prostration is marked, he considers a pill composed as follows very valuable:

℞.—Arsenious acid	. . . .	gr. $\frac{1}{10}$.
Dried sulphate of iron Extract of sumbul	} .	āā gr. j.
Asafœtida	. . . . .	gr. ij.—M.

One pill after each meal, increasing to two pills after each meal.—*University Medical Magazine*, December, 1889.

The Prevention of Cinchonism.—DR. COGLITORE asserts that if quinine is administered with opium and ergotin the danger of cinchonism is avoided. The following is the formula which he uses:

℞.—Sulphate of quinine	. . .	grs. xij.
Bonjean's ergotin	. . . .	grs. v.
Opium	. . . . .	grs. j.—M.

Divide into three powders, of which one may be given every hour.—*Journal American Medical Association*, December 7, 1889.

Ointment for Scabies.—According to the *Physician and Surgeon*, the following is an efficient ointment for scabies:

℞.—Sublimed sulphur	. . . .	ʒij.
Beta-naphthol	. . . .	ʒj.
Peruvian balsam Vaseline	} . .	āā ʒj.—M.

One-third of this ointment should be rubbed into the affected skin on three consecutive nights, and washed off in the morning. After the first inunction the patient's underclothes should be boiled.

The Administration of Cocaine.—At a recent meeting of the New York Academy of Medicine, Section on Laryngology and Rhinology, DR. KÖHLER, the discoverer of the anæsthetic properties of cocaine, said that he never gave a patient a prescription for the drug, but that, if it was to be used, he himself gave it. For application to mucous membranes he does not use solutions

of a greater strength than five per cent.; which will accomplish as much as stronger solutions, though requiring a little more time.

Menthol in Asthma.—THEODORE JORES relates, in the *Memorabilien*, October 31, 1889, his experience with menthol in a case of asthma which had obstinately resisted all the usual methods of treatment. During a paroxysm he caused the patient to inhale an atomized 20 per cent. solution of menthol in olive oil. Relief was immediate. Dyspnœa was at once replaced by quiet breathing, and the respiratory sounds, which before the inhalation had been noisy and sibilant, became clear. Since then he has used the drug, in the same manner, in all cases of asthma under his care, and invariably with satisfactory results.

Treatment of Tubercular Prostatitis.— According to BERKELEY HILL, in a recent lecture before the Royal College of Surgeons, a good antiseptic solution in the treatment of tubercular prostatitis is two grains of sulphate of quinine to the ounce of water, two ounces being injected and left in the bladder after the pus and urine have been well cleared out by repeated small injections of boric acid solution. Still more antiseptic is an emulsion of iodoform. In cases of chronic cystitis, if the bladder is well washed, and two drachms of this emulsion injected, the most fetid ammoniacal urine is replaced by acid urine, fetor disappears, and the pus rapidly diminishes. In cases of cystitis caused by neglected prostatic retention, the urine in ten days becomes quite free from deposit, and even when a calculus, tumor, or malignant ulceration coexists, the improvement is rapid.—*London Medical Recorder*, August 20, 1889.

Treatment of Syphilis.—In a discussion on the treatment of syphilis at the International Congress of Dermatology and Syphilography, DR. MCCALL ANDERSON said that treatment should not be instituted until unmistakable symptoms of the disease were manifested. Mercury he believed was of value not only in the early stages, but often in tertiary syphilis, especially in lesions of the nervous system, and in cases where the iodides had been found powerless. Hypodermatic injections and inunctions of mercury he preferred to administration by the mouth. Dr. Langlebert said that treatment should commence with the prodromata of the secondary period—headache, fever, etc.—and should be continued during the whole period of eruption. He never gives mercury in the intervals between the manifestations on the skin or mucous membranes, as he regards the drug powerless to prevent such manifestations. On the other hand, the iodides are preëminently suited for chronic syphilis. The average time of treatment by the iodides should be about three years. Arsenic, iron, quinine, and sulphur are of value as tonic remedies, but should always be secondary to mercury and the iodides.—*Journal of Cutaneous and Genito-urinary Diseases*, November, 1889.

Pineapple Juice in Bronchitis.—DR. FLASCHER recommends the juice of the pineapple as an excellent remedy to soften the tenacious mucus of catarrhal bronchitis. In chronic bronchitis accompanied by dyspnœa he has also seen quite remarkable results. The juice is prepared by slicing the fruit, sprinkling with sugar, placing in a jar and bringing to a boil. The juice may then be poured into smaller bottles and kept for some time. It is prescribed in doses of from eight to ten teaspoonfuls.—*Lyon Médicale*, October, 1889.

Sparteine.—LEWASCHEW has recently made a series of careful observations upon the action of sparteine sulphate which he administered to twenty-two patients. In seven of the cases a more or less distinct therapeutic influence was produced, but in the remaining fifteen there was no perceptible effect produced upon either the action of the heart or the excretion of urine. These studies, together with a review of all the literature upon the subject, lead him to the following conclusions:

1. Sparteine strengthens hearts which are simply weak and arythmic, and if the pulse is rapid reduces its frequency.

2. In such cases it causes increase of blood-pressure with decrease or entire abolition of vascular engorgement, increased excretion of urine, lessening of dyspnœa, and removal of œdema.

3. Diuresis is not due to the direct influence of the drug upon the renal epithelium, but to the increased blood-pressure.

4. The effects of sparteine on the heart are similar to those of digitalis, adonidine, and strophanthus.

5. In many cases of long duration with considerable degeneration of the heart-walls, the last-mentioned drugs will be of more service.

6. For the latter reason sparteine should be used only in recent cases.

7. When good effects follow they are often observable within fifteen minutes after its administration.

8. The most generally useful dose is from one-fourth to one grain, three or four times daily.—*Centralblatt für klin. Medicine*, November 9, 1889.

Antiseptic Properties of Ammonium Carbonate.—GOTTBRECHT has lately experimented on the anti-fermentative action of ammonia. In his experiments he used carbonate of ammonium. A two per cent. solution of this salt delayed the decomposition of portions of fresh organs for nine days, a five per cent. solution for nineteen days, while a ten per cent. solution delayed it for sixteen days. In mixtures in which decomposition had already occurred, ammonium carbonate, added to the amount of five per cent., after a time killed the organisms; while a two and one-half per cent. admixture of the salt diminished their activity, smaller proportions of ammonium carbonate, one-fourth to one per cent., not only did not diminish, but actually increased the activity of the organisms, so that putrefaction became more rapid. Sodium carbonate added to the same degree of alkalinity did not show any anti-putrefactive effect.—*Alienist and Neurologist*, October, 1889.

Malarial Fever and the Puerperium.—DR. KRUSENSTERN, of Tiflis, publishes an interesting paper (*The Trans-Caucasian Lying-in Hospital Reports for* 1889, p. 59) on malarial fever appearing in the course of the puerperal period, in which he argues that (1) malarial fever gener ally, its remittent form in particular, does not in the least retard the post-partum involution of the womb, the organ decreasing in its bulk as it does under perfectly

normal conditions. Though several authors have described cases of uterine subinvolution in malarial puerperal women, the real cause in such cases should be sought, not in the malarial process or virus itself, but simply in an intercurrent endometritis accidentally complicating the fever. (2) On the other hand, malarial fever manifests a very marked influence on the functions of the mammary glands, since the appearance of the disease in puerperal women is invariably followed by a striking decrease in the secretion of milk.—*Provincial Medical Journal*, November, 1889.

Typhlitis and its Treatment.—In a discussion on this subject, at a recent meeting of the British Medical Association, Mr. Treves divided typhlitis into:

1. The mild form, which is the most common, amenable to simple medical treatment, usually terminating in resolution, and probably due to fecal accumulation in the cæcum. With this variety must also be included some cases of appendicitis which terminate favorably. The symptoms are less marked than in the graver cases. It is commonly preceded by constipation, rigors seldom occur, the swelling appears earlier and is comparatively larger, and doughy, is less fixed and cannot so readily be felt through the rectum. This is the form that physicians have in mind when opposing surgical treatment.

2. The severe variety, leading to suppuration and almost invariably dependent on disease of the appendix. The symptoms are more grave than in the former, and progress more rapidly. It is not usually preceded by constipation. There is often a history of cold or injury, pain is severe, vomiting frequent, tenderness and other signs of peritonitis pronounced, and fever high. The tumor makes its appearance more slowly, can usually be felt through the rectum, and is more fixed. The pain radiates to the testicles, thigh, or perineum, and is often accompanied by tenesmus and difficult urination. Pain on moving the right thigh may be great. At varying periods of time signs of suppuration appear. In some cases the first manifestations of the disease are symptoms of perforation, which may terminate fatally in two or three days, or even less. On the other hand, the symptoms may appear very slowly.

3. Relapsing typhlitis, due to disease of the appendix not sufficient to cause suppuration. If an abscess forms and the patient recovers, he is not likely to have another attack. This variety is usually independent of constipation.

The treatment of the mild form should consist in rest, small doses of opium, the least possible amount of fluid food, leeches or counter-irritation, and early evacuation of the colon by enemata.

Surgical treatment is required in the severe forms, but is seldom advisable before the fifth day. The exploring needle is to be condemned as a means of detecting pus. The incision should be made, if possible, directly over the seat of suppuration, a median incision being unsatisfactory.

As a rule, the most convenient incision is one made obliquely from above downward and inward, just external to the deep epigastric artery, terminating a little above and to the outer side of the middle of Poupart's ligament. A careful examination should be made for concretions or foreign bodies, and the condition of the appendix determined, if possible. These investigations should be conducted with the greatest care, the frail character of the abscess wall should be borne in mind, and regard be paid to the fact that it is made up of fresh adhesions, and often of loosely attached coils of bowel. The careless introduction of the finger may break down important adhesions, and cause a perforation into the general peritoneal cavity, or may bare a portion of the exposed cæcum of its serous covering. The less that is done after the abscess has been opened the better.

The cavity should be washed out with a warm, weak antiseptic fluid. A large drainage-tube is then introduced. If a diseased appendix is found, it should be ligated with catgut, unless it is entirely gangrenous or perforated close to the cæcum, in which case it should be left untouched.—*British Medical Journal*, Nov. 9, 1889.

The Bacillus of Whooping-cough.—DR. SEMTCHENKO has recently studied the bacteriology of whooping-cough, and in fourteen consecutive cases of the disease found the bacterium described by Afanasïeff, while it was invariably absent in patients suffering from other diseases of the respiratory tract. The author's conclusions are: 1. Afanasïeff's bacterium is specific. 2. The microörganism makes its appearance in the sputum during the catarrhal stage, about the fourth day of the disease, or possibly earlier. 3. Subsequently, its numerical strength increases, the intensity of paroxysms keeping pace with the increase. 4. The microbes disappear from the discharge, apparently, somewhat before a complete cessation of whoops (about the time when the number of paroxysms sinks to four or two per day). 5. When pertussis becomes complicated with catarrhal pneumonia, the bacilli in the patient's sputa show an enormous increase in number. 6. Altogether the pertussis pneumonia seems to be quite different from other varieties of pulmonary inflammation. 7. The *bacillus tussis convulsivæ* presents a great importance not only in etiological and diagnostic, but also in prognostic regards. 8. As to the behavior of the microbe toward antiseptic agents, its vitality is destroyed when the culture medium contains corrosive sublimate in the proportion of 1 to 60,000, or resorcin in that of 1 to 1200, or phenol in the same strength, or hydrochlorate of quinine of 1 to 800.—*London Medical Recorder*, November 20, 1889.

Peruvian Balsam in Diseases of the Respiratory Tract.—A correspondent of the *British Medical Journal* writes that PROF. SCHNITZLER, of Vienna, has used Peruvian balsam in various affections of the larynx, trachea, bronchi, and lungs, as well as those of the mouth, nasopharyngeal cavity, and nose. The results were good in the vast majority of cases. The drug was used in the form of inhalation, and was also applied with a brush, with the spray-producer, and internally. Finally, the most important constituent of the Peruvian balsam—namely, the cinnamein—was also tried. Inhalations of the Peruvian balsam did not differ in effect from those of turpentine, and they were equally indicated in affections of the bronchi and lungs. Inhalations of the emulsion of Peruvian balsam, however, were, according to Schnitzler, very efficacious in many diseases of the larynx and the trachea.

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PATHOGENIC PROPERTIES OF THE MICROBES FOUND IN MALIGNANT TUMORS.

PROFESSOR VERNEIUL, who for several years past has been prominent among those who have investigated the important question of the relation between microörganisms and malignant tumors, contributes in the *Revue de Chirurgie* for October, a valuable paper, reviewing briefly his earlier work and that of others supporting his views; presenting its practical or clinical application in anything but doubtful language. The points of the paper are clearly summed up in the following conclusions:

"1. The tissue of malignant neoplasms, cancers, sarcomata, epitheliomata, etc., may be invaded at a given moment by various microbes, of which neither the origin, the kind, nor the number can as yet be determined.

"2. This invasion, the causes and mechanism of which are equally unknown, may remain latent for a longer or shorter period of time, but also in certain cases may cause various modifications in the growth and nutrition of tumors, amongst other things, rapid extension, softening, and ulceration.

"3. Microbes are not met with in all varieties of neoplasms, nor in every tumor of the same sort, nor, yet, in all parts of an invaded tumor. One does not find them, for example, in lipomata, in pure fibromata, in beginning carcinomata, or in sarcomata of slow growth, in their normal condition, and covered with healthy skin; on the contrary, one finds them almost constantly in broken-down and ulcerated neoplasms.

"4. These microbes, besides the irritation and inflammation which they cause locally in the tissue of the invaded tumor, possess other pathogenic properties which may concern the entire economy. Thus, in all probability, they are capable of lighting up a more or less intense and irregular fever while still enclosed in a tumor undergoing rapid growth and softening. Moreover, when, during the removal of a tumor which contains them, they are mingled with the fluids of the softened areas, and permitted to spread themselves in the field of operation, they are capable of infecting and inoculating it so as to provoke a septic fever capable of causing death.

"5. The recognition of this latter fact, besides pleading in favor of the early removal of malignant neoplasms, so desirable from all points of view, indicates forcibly to surgeons certain preventive measures before and after the removal of tumors infected by microbes."

Thus it will be seen that Verneuil is not one of those who believe that the etiological relation between microörganisms and neoplasms is one of cause and effect. But it will also be observed that he ascribes to them when present in a growth results of the gravest consequence.

The above conclusions, verified by faithful investigation and drawn from abundant evidence, speak for themselves in a manner so plain as scarcely to need comment.

The support which is given to the plea for early surgical interference in cases of malignant tumor is positive; and the demand for extraordinary vigilance in carrying out antiseptic precautions during the removal of such growths, when they have undergone ulceration or softening, is shown to be of especial urgency.

THE TREATMENT OF GASTRIC CATARRH.

THERE is probably no one ailment of a non-organic character seen by the practitioner of medicine in every part of the United States which is more widely distributed, has a greater variety of symptoms, or is so discouraging to treat, than the one before us. Affecting alike the child and the adult, and the rich and poor, it follows as a result of all manner of exciting causes, from the taking of a simple cold to

the constant or sudden employment of substances irritating to the stomach.

From the title given above many pages might be written, none of which would be wasted by useless descriptions of the pathological changes and the variation in the results, and all of which might be filled with remarks upon the treatment of these conditions. The main object of this editorial is, however, to point out several facts generally overlooked in the treatment of gastric catarrh and in that of similar conditions in the smaller bowel. No disorder can be correctly divided into two distinct portions, called acute and chronic, more readily than this, and no complaint needs more correct diagnosis as to its exact stage than gastric catarrh. Totally excluding all forms of true gastritis reaching more deeply into the tissues than the mucous membrane, we find that very rarely do we see our patients in the acute stage of their attack, but rather in the subacute stage, when the separation of one state from the other is much more difficult. Under these circumstances exactitude in diagnosis is most necessary, for, if it still be in the acute stage, the treatment is utterly different from that of the later periods. If the acute stage is present, there is a condition of hunger, or anorexia, according to the peculiarity of the individual, but the taking of food increases any distress which may be present and delays the cure. Partial or total abstinence from solid food is urgent; extremely hot and cold fluids are of evil effect. The treatment of this stage is really made up of rest of the stomach and entire body, and in the use of mild nutrient drinks of a quieting character—such as predigested warm milk. A slight counter-irritant—such as a spice plaster over the belly may be used. These are points universally recognized, but there are others that are not. Constantly one sees some of the bitter tonics prescribed under those circumstances, with entire disregard of the name of the class to which those drugs belong, namely, the "tonic." The fact is forgotten that during the acute stage of an inflammation the tone of the part is above par, not below it, and that it is only after the inflammation passes by that a state of atony or depression is developed. By the use of a so-called tonic during the first stage we spur on to a more angry state a membrane too readily prepared to excessive activity of a perverted type. It is in the second stage, not the first, in which the pendulum has swung to the other side of the abscissa line of health that calls for a stimulating, toning, or tonic treatment—always to be given before meals, so as to affect the stomach itself when it is not covered by food. In the still more advanced stages of this condition, tonics become useless and incapable of action. As well might one supply a lancet for an amputating knife as to attempt to buoy up to the normal line by ordinary tonics a gastric mucous membrane so depraved and depressed into the slough of abnormal activity as is that of chronic gastric catarrh of long standing. If there be much eructation of yeasty matters, or sour gases, or other evidences of fermentation, let pills of nitrate of silver and hyoscyamus precede the meals by half an hour or an hour, or employ hydrochloric acid, in ten-drop doses, in its place, if such symptoms are not present. The remembrance of such ordinary rules of common sense will prevent a large amount of bad treatment and disappointment.

REVIEWS.

CHEMISTRY: GENERAL, MEDICAL, AND PHARMACEUTICAL. By JOHN ATTFIELD, F.R.S. Twelfth Edition, 8vo., pp. 770. Philadelphia: Lea Bros. & Co., 1889.

A work which has reached twelve presumably large editions since 1867 has demonstrated its suitability for the field for which it was designed. Attfield's *Chemistry* has, indeed, divided with Fownes's the honors of a standard work of reference for medical and pharmaceutical students, and has been rather better suited to medical and pharmaceutical laboratory work. In recording the appearance of the present edition, the reviewer can do little else than repeat the encomiums that have been bestowed upon all the editions of recent years. The work is comprehensive, and highly accurate. The practical, analytical portions are brought up to date. The theoretical matter is distributed over the entire work, different topics being introduced in association with those departments of descriptive chemistry by which they are best illustrated.

It is, perhaps, to be regretted that the author has not seen fit to adopt completely the modern nomenclature for salts, and to write, therefore, "magnesium sulphate" in preference to "sulphate of magnesium." The latter form, dependent essentially on a mistranslation of the French phrases, has been slowly disappearing from the writings of chemists, and the progress of the reform is delayed when a manual of acknowledged excellence and extended use tends to perpetuate the older method.

The arrangement adopted by Attfield has always been somewhat less systematic than other manuals of its size and style, and in the earlier editions this fact interfered with the satisfactory use of the work as a lecture companion or for regular study; but in the more recent editions, and particularly in the present, a copious index enables all necessary references to be made quickly. It is not unlikely that for the purposes of American medical and pharmaceutical students the more extended use of different sizes of type would be advantageous, and that

portions of the descriptive chemistry—for instance, the account of the various essential oils—would be more suitable for reference if expressed in condensed tabular form.

The mechanical execution of the book is excellent. The type is clear, and free from error. The work of revision for the present edition has been especially extensive in the department of organic chemistry. A valuable feature is the attention given to the etymology and significance of scientific terms. Such matters tend to give vitality to terminology, and to assist the student in remembering.

SURGICAL BACTERIOLOGY. By NICHOLAS SENN, M.D., Ph.D. 8vo., pp. 259. Philadelphia: Lea Brothers & Co., 1889.

BUT a short time since there was an almost universal smile of ridicule at the announcement of the discovery of the cancer microörganism, and now other writers besides our author deal respectfully with the idea, even if the most of them cannot accept even its probability. Reviewing with Dr. Senn the literature of this subject, and accepting his conclusions as to the utter lack of proof of the existence of this germ, one can scarcely help thinking, nevertheless, of what might have been the consequences had Scheuerlen's announcement been capable of corroboration. Such consequences have followed with uniform regularity the absolute acceptance of every specific microörganism; and with the same regularity have our various text-books, medical and surgical, been forced to general revision, or have been neglected as unsound and unscientific. With such circumstances in view, the appearance of such a work as Dr. Senn's seems well-timed and appropriate.

The author introduces his prime subject after a careful review of the literature of such general considerations as the hereditary transmission of microbic diseases, infection by microörganisms, and the localization and elimination of these germs. Inflammation, while recognized by the author as frequently of a simple nature, is evidently regarded from a surgeon's point of view as almost uniformly of microörganismal origin. Such view, too, is intimated in the definition of "that condition called inflammation, a restorative process which has for its object the repair of injured tissues, or the neutralization or removal of the primary microbic cause"—the specification of microörganisms as a primary cause being evidently introduced as a feature of importance in the definition. As secondary to microbic activity in the production of inflammation, and later in pus formation, the results of these activities, ptomaines, are accepted by the author; and the formation of inflammatory abscesses is regarded as practically never occurring without the presence of microörganisms or their results. The wound fevers are treated of in some detail. Septicæmia is recognized by Dr. Senn as occurring both clinically and experimentally either as a true progressive septicæmia caused by the introduction of microörganisms into the tissues, and their subsequent activities, or as sapræmia, a putrid intoxication in which the prime factor is not the bacteria, but ptomaines to which they have given rise, or to other substances the result of tissue disintegration. The origin of pyæmic disturbances the author believes to be due primarily to microörganisms different from those of septicæmia, but he acknowledges the possibility of its being identical with a form of sapræmia. In harmony with his belief in the duality of these two wound fevers, the author accepts Leube's combination of the two under the name of septico-pyæmia—a condition in which post-mortem appearance as well as clinical symptoms point to septic and purulent infection.

In the consideration of tuberculosis the author happily goes to some pains to point out the identity of this condition and that of lupus. In the surgical relations of tuberculosis Dr. Senn urges the frequent local occurrences of the process, and advocates a thorough surgical procedure in such instances as proper—although he adds a word of caution as to the likelihood of traumatic disseminations following operations imperfectly performed, both in tuberculosis and in other mycotic processes as well. Considerable attention is paid the subjects of anthrax, glanders, actinomycosis, tetanus, gonorrhœa, and syphilis, both in their general features and in their possible relations to surgical measures. Speaking of tetanus as an infectious disease, it has occurred to us as rather curious that more mention of the curious epidemics of this disease has not been made in the literature, epidemics, or possibly endemics, being frequently met with in certain parts of Cuba, Brazil, and other localities.

Considered generally, Dr. Senn's book is to be highly commended. While, of course, a work of its nature must, at this period of our knowledge of bacteriology, be largely a review of more or less conflicting literature, there need be no mistaking of the author's teaching and position in the mass of compilation necessary to the full purpose of the volume. The arrangement of the subject-matter is admirable; and the method of treating each subject, noticing the history of the microbe in question, the technique necessary to its demonstration, and the culture and inoculation experiments, must be regarded as serving an excellent object. The printing is excellent, and the illustrations add considerably to an already well-made book.

NEW INVENTIONS.

A NEW ROTARY PRISM.[1]

BY S. D. RISLEY, M.D.,
OPHTHALMIC SURGEON TO THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA.

I PRESENT here a new, and I think a more convenient, form of revolving prisms than those heretofore in use. Adopting the principle first put in practice by Volkmann, and latter by Cretes, two prisms of fifteen degrees each are superimposed, with their bases in opposite directions. They are mounted in a delicately milled-edge cell, with a diameter the same as those employed in the Nachet trial-glasses, which, therefore fits readily into the ordinary trial-frame. The milled-edge permits its convenient turning in the frame, so that the base or apex of the prism can be readily placed in any desired direction. The prisms are caused to rotate over each other in opposite directions by means of a milled-head screw projecting from the front of the cell. The strength of the successive prisms, resulting from the rotation, is read off on the graduated scale engraved on the front plate of the containing cell, extending from zero to thirty

[1] Presented at the American Ophthalmological Society, July, 1889.

degrees, the combined value of the composing prisms. (The strength of these prisms has since been increased so that the combined value is forty-five degrees.) As constructed, it will usually be found most convenient to place the instrument before the left eye, when the rotating screw, with the zero mark vertical, will stand at the upper and outer quadrant and can be readily manipulated without the hand of the operator obstructing the patient's vision. In this position, turning the screw to the right or left will cause the base of the resulting prisms to be inward and outward—that is to say, toward the nose or temple—as may be desired, when the strength of the adducting or abducting muscles is to be determined. If the vertical muscles are to be examined, the zero points may in like manner be placed horizontally, by simply turning the containing cell in the trial-frame. The main features of the instrument are well shown in the accompanying cut.[1]

Since writing the above description of the instrument I have found great advantage from its use in conjunction with the Maddox double prism. For this purpose I have had the latter mounted in a Nachet cell, which is then placed in a trial-frame, or preferably in some fixed form of apparatus, and the rotary prism on the opposite side. The revolving prism being at zero, any deviation of the images, in the resulting tripolopia, whether lateral or vertical, can be rapidly measured, its value being read off on the scale of the rotary prism. If preferred, the displacement prism can be employed as usual. If the double prism is used, it should have a strength of at least six degrees. The examination, especially when the triplopia test is employed, is greatly facilitated by some fixed form of apparatus, so that a constant relation can be maintained between the test object, the prisms, and the eyes of the patient, conditions not readily secured when the trial frame is used.

NEWS ITEMS.

Pharmacopœial Statistics.—The *National Druggist* states that according to statistics presented at the late Congress of German Naturalists and Physicians, there are now in use in the world twenty pharmacopœias, which, with their official supplements and commentaries, make about forty volumes. The French *Codex* contains the greatest number of subjects, viz., 2039, and the Norwegian *Pharmacopœia* the least, 519. In the French there are no fewer than 106 syrups, while the German has but twenty, and the Norwegian only 9. England is the only country that still retains the old system of weights, all the others using the decimal system. Only 150 articles or titles are common to all of the pharmacopœias.

Prosecution of Unregistered Dentists.—The New York State Dental Association has instituted proceedings against dentists who have failed to register. The prosecutions were begun in Brooklyn, five convictions being secured at the first day's trial. The minimum fine of fifty dollars was imposed; the largest possible fine for the offence under the registration act is two hundred dollars.

Football Fatality.—The *Lancet*, November 23d, reports a death at Bootle, England, following "rough play" at football. The player who lost his life was thrown violently and sustained an injury to the spinal cord. The index of the *Lancet* for the first half of 1889 shows that there have been sixteen paragraphs relative to the "accidents" in this athletic sport.

Hygienic Institute at Heidelberg.—The University of Heidelberg has inaugurated an Institute of Hygiene, with Professor Freidreich Knauff at its head. Dr. Knauff has written upon the subjects of hospital administration and the water-supply of cities.

Vienna Clinic for Mental Disease.—Dr. Richard von Krafft-Ebing, of Gratz, has been appointed to succeed the late Dr. Leidesdorf at the Vienna Clinic for Mental Diseases. A brochure on hypnotism by Professor von Krafft-Ebing has recently been translated by Dr. Charles G. Craddock, of the North Michigan Asylum.

The Care of the Insane.—At a stated meeting of the Chester County Medical Society, held in West Chester, October 8, 1889, the matter of the administration and medical treatment in the hospitals of the State for the cure of the insane was fully and ably presented by Dr. Hiram Corson, of Montgomery County. After full discussion, Dr. Jacob Price moved the following resolution: "That, in the opinion of this Society, the medical administration in these institutes should be separated from the secular duties pertaining to them; and, second, that medical care of female patients should be confided to properly skilled women physicians.

"*Resolved*, That the foregoing resolutions be embodied by the Secretary in his report to the State Society, and also that they be published in THE MEDICAL NEWS."

The Babies' Hospital.—Dr. L. Emmett Holt has been appointed attending physician to the Babies' Hospital, in place of Drs. Sarah J. and Julia McNutt, resigned. The Hospital is now permanently located in a building of its own, on the corner of Lexington Avenue and Fifty-fifth Street. It has a capacity of thirty-five beds, and is devoted exclusively to the care of sick children under two years of age. It receives any non-contagious case. In connection with the Hospital, a Training-school for Nurse-maids, which has been organized by Mrs. R. W. Chapin, will be opened in December. The Hospital has been in active operation in its new quarters since October. It was formally opened on December 6th.

Donation to the Pasteur Institute.—The *British Medical Journal* of November 9th states that a donation of

[1] Manufactured by Borsch & Rommel, Walnut and Juniper Streets, Philadelphia.

40,000 francs from English subscribers has been made to M. Pasteur, for the use of the Pasteur Institute at Paris. It was given in recognition of the services rendered to over two hundred British subjects who had been successfully treated there after having been bitten by rabid dogs. The *Journal* also states that some have proposed to establish a Pasteur Institute at Cambridge, and an estimate has been made that with the sum of £700 the running expenses of the first year can be met.

American Physicians Abroad.—A writer in the *London Medical Recorder* remarks, with some surprise, that at the last summer session of the Vienna University there were sixty-two American physicians and students in attendance, and not one from England on the catalogue. The physicians of the latter country seem to enter practice earlier, and do not give themselves that *Wanderjahr* "without which," thinks the writer, "no American physician seems to be able to settle down in practice." Little does that writer know of the hundreds of graduates of our interior colleges who never come even far enough eastward to get the smell of salt-water.

Yellow Fever in Brazil.—If sanitary reasons are allowed to rule, no naval vessel of the United States will be sent to the new Brazilian Republic at present. The condition of Rio, and of a number of other ports, in regard to the prevalence of fever, indicates a most unhealthy season. Whatever may be the indications from a political standpoint, the sanitary, prudential view would impel everyone to give Brazil a wide berth during the next six months.

Influenza in Paris.—It is stated that the epidemic of influenza in Paris is spreading. The disease has made its appearance in the barracks, the markets, and the Ecole Centrale. The medical report upon the epidemic shows that there are 670 cases among the employés in the great dry-goods store, the Magasin du Louvre. These are all cases of simple benign influenza, with an average duration of four days. Complications arise in some cases which make it more serious. In other large stores it also prevails. A dispatch from Berlin says that the disease is also epidemic in that city, and that Professor Virchow is one of the sufferers.

The "Italian Virchow."—Dr. Guido Baccelli, of Rome, Professor of Clinical Medicine, and formerly Minister of Public Instruction, is an extremely popular member of the party of progress. The *Lancet*, comparing Baccelli's position in Italy with that of Virchow in Germany, says that he is a public-spirited and intelligent statesman, and the friend and promoter of every measure of substantial reform. Dr. Baccelli is an ex-president of the Roman Academy of Medicine.

The Result of Recommending a Patent Nostrum.—According to the *Medical Press*, the Colleges of Physicians and Surgeons, Ireland, have resolved to restore the diplomas which they had withdrawn from one of their Licentiates, for having allied himself with Warner, the "Safe Cure" man, and having allowed his name to be used in the advertisement of the nostrum. The Licentiate asseverated that the letters purporting to have been written by him in eulogy of the "Safe Cure" were forgeries, and in order to prove this statement, he commenced action against the manufacturers, which, however, he was unable to bring to an issue for want of funds. Notwithstanding these representations by the Licentiate, and the most humble apologies offered by him for his conduct, the Colleges on two occasions refused to reinstate him.

The American Physiological Society.—The American Physiological Society will hold its annual meeting at the College of Physicians and Surgeons, New York, on December 27 and 28, 1889, and will join the American Society of Naturalists, which meets at the same time, in an annual dinner.

The International Medical Congress.—It is stated that the German Government has appropriated 80,000 marks ($20,000) for the International Medical Congress which meets in Berlin in 1890.

Surgeon Porter and His Resignation.—Surgeon Joseph Y. Porter, whose resignation from the Army was accepted by Secretary Proctor last summer, after a difficulty arising from his being ordered from Florida to New Orleans, has petitioned Congress, through Senator Gibson, to place him on the Retired List of the Army.

Diphtheria at May's Landing.—It is stated that diphtheria of a malignant type is epidemic at May's Landing, New Jersey. Strong efforts are being made to prevent the disease from spreading.

The Growth of Cremation.—According to *Science*, there are now thirty-nine crematories in various parts of the world. Italy has twenty-three; America has ten; while England, Germany, France, Switzerland, Denmark, and Sweden have one apiece. In Italy there were two cremations in 1876; the number rose to fifteen in 1877, and in 1888 the number was 226. Since 1876, 1177 cremations have taken place in Italy, while the combined numbers in all other countries brings the total only to 1269.

The Surgeon of the Emin Relief Expedition.—Mr. Henry M. Stanley thus eulogizes Surgeon Thomas H. Parke, of the English Army, who accompanied the Emin Relief Expedition: "The hardest-worked man in the expedition was our surgeon. Ever since leaving Fort Bodo in December Surgeon Parke attended over a hundred sick daily. There were all kinds of complaints; but the most numerous, and those who gave the most trouble, were those who suffered from ulcers. So largely had these drained our medicine-chests that the surgeon had nothing left for their disease but pure carbolic acid and permanganate of potash. Nevertheless there were some wonderful recoveries during the halt of Stairs' column on the Ituri River in January. . . . I do not think I ever met a doctor who so loved his 'cases.' To him they were all 'interesting,' despite the odors emitted and the painfully qualmish scenes. I consider this expedition in nothing happier than in the possession of an unrivalled physician and surgeon. . . . "Nothing happened during the long journey from the Albert Lake to cause us any regret that we had taken this straight course, but

we have suffered from an unprecedented number of fevers. We have had as many as 150 cases in one day. Aukori is so beswept with cold winds that the expedition wilted under them. Seasoned veterans like the Pasha and Captain Casati were prostrated time after time, and both were reduced to excessive weakness like ourselves. Our blacks, regardless of their tribes, tumbled headlong into the long grass to sleep their fever fits off. Some after a short illness died; the daily fatigues of the march, an ulcer, a fit of fever, a touch of bowel complaint, caused the Egyptians to hide in any cover along the route, and, being unperceived by the rearguard of the expedition, were left to the doubtful treatment of natives with whose language they were utterly ignorant. In the month of July we lost 141 of their number in this manner."—*Lancet.*

Dr. H. Newell Martin's Lectures.—DR. H. NEWELL MARTIN is delivering a series of lectures upon the "Relations of Psychology to Physiology," at Johns Hopkins College.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM NOVEMBER 19 TO DECEMBER 9, 1889.

By direction of the Secretary of War, the extension of leave of absence, on surgeon's certificate of disability, granted LEONARD Y. LORING, *Major and Surgeon*, in S. O. No. 241, October 16, 1889, from this office, is still further extended one month, on surgeon's certificate of disability.—Par. 3, *S. O. 268, Headquarters of the Army, A. G. O.*, November 16, 1889.

MOSELEY, EDWARD B., *Captain and Assistant Surgeon.*—Is relieved from duty at Whipple Barracks, Arizona, to take effect upon the expiration of his present leave of absence, and will report in person to the commanding officer Fort Clark, Texas, for duty at that station, reporting by letter to the commanding general Department of Texas.—Par. 4, *S. O. 268, A. G. O.*, November 16, 1889.

FISHER, WALTER W. R., *Captain and Assistant Surgeon.*—Is relieved from duty at the Presidio of San Francisco, California, and will report in person to the commanding officer Fort Assinniboine, Montana Territory, for duty at that station, reporting by letter to the commanding general Department of Dakota.—Par. 4, *S. O. 268, Headquarters of the Army, A. G. O.*, November 16, 1889.

EBERT, RUDOLPH G., *Captain and Assistant Surgeon.*—The leave of absence, on surgeon's certificate of disability, granted in S. O. 109, May 11, 1889, from this office, is extended six months, on surgeon's certificate of disability.—Par. 13, *S. O. 270, Headquarters of the Army, A. G. O.*, November 16, 1889.

By direction of the Secretary of War, the extension of leave of absence granted VALERY HAVARD, *Captain and Assistant Surgeon*, in S. O. 240, October 15, 1889, from this office, is further extended one month.—Par. 1, *S. O. 272, A. G. O.*, November 21, 1889.

BALL, R. R., *First Lieutenant and Assistant Surgeon* (Fort Riley, Kansas).—Will proceed to Fort Sill, Indian Territory, and report to the commanding officer, for temporary duty at that post.—Par. 2, *S. O. 173, Department of the Missouri*, November 21, 1889.

By direction of the Secretary of War, JAMES E. PILCHER, *Captain and Assistant Surgeon*, is relieved from duty at Fort Ward, New York Harbor, and will report in person to the commanding officer Fort Clark, Texas, for duty at that station, reporting also by letter to the commanding general Department of Texas.—Par. 3, *S. O. 276, A. G. O.*, November 26, 1889.

COCHRAN, JOHN J., *Captain and Assistant Surgeon.*—Is granted leave of absence for fifteen days, to commence about December 1, 1889.—Par. 8, *S. O. 272, Division of the Atlantic*, November 27, 1889.

WOLVERTON, WILLIAM D., *Major and Surgeon* (Fort Douglas, Utah Territory).—Is hereby granted leave of absence for one month, to take effect on or about December 18, 1889, with permission to apply at Headquarters Division of the Missouri for an extension of seven days.—Par. 2, *S. O. 114, Department of the Platte*, November 30, 1889.

By direction of the Secretary of War, JOHN DE B. W. GARDINER, *Captain and Assistant Surgeon*, will be relieved from duty at Fort Reno, Indian Territory, upon the arrival at that post of Captain and Assistant Surgeon James C. Merrill, and will report in person to the commanding officer Fort Supply, Indian Territory, for duty at that post.—Par. 8, *S. O. 279, A. G. O.*, November 30, 1889.

MCCAW, WALTER D. *Captain and Assistant Surgeon* (Fort McPherson, Georgia).—Is hereby granted leave of absence for fifteen days.—Par. 3, *S. O. 276, Division of the Atlantic*, December 3, 1889.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE WEEK ENDING NOVEMBER 7, 1889.

RUSH, W. H., *Passed Assistant Surgeon.*—Ordered to U. S. S. "Saratoga."

URIE, J. F., *Assistant Surgeon.*—Detached from Coast Survey Steamer "Gedney," and ordered to the U. S. S. "New Hampshire."

BRYANT, P. H., *Assistant Surgeon.*—Detached from the Norfolk Hospital, and ordered to the Coast Survey Steamer "Gedney."

SMITH, GEORGE T., *Assistant Surgeon.*—Detached from the Army and Navy Hospital, Hot Springs, Arkansas, and ordered to the Naval Hospital, Norfolk, Virginia.

STONE, E. P., *Assistant Surgeon.*—After examination for promotion, await orders at Boston, Massachusetts.

GUNNELL, F. M., *Medical Director.*—Placed on the Retired List, November 27, 1889.

GAINES, J. H., *Surgeon.*—Ordered to duty at the Army and Navy Hospital, Hot Springs, Arkansas.

NEILSON, J. L., *Surgeon.*—Detached from the U. S. S. "New Hampshire," and ordered to the U. S. S. "Portsmouth."

BEYER, H. G., *Passed Assistant Surgeon.*—Detached from the U. S. S. "Portsmouth," and placed on waiting orders.

SIEGFRIED, C. A., *Surgeon* —Detached from the Naval Station, New London, Connecticut, and ordered to the "New Hampshire."

HALL, JOHN H., *Passed Assistant Surgeon.*—Ordered to the Naval Station, New London, Connecticut.

KITE, I. W., *Assistant Surgeon.*—Detached from the Naval Hospital, Philadelphia, Pa., and ordered to the Naval Hospital, Pensacola, Florida.

ROSS, J. W., *Surgeon.*—Detached from the Naval Hospital, Pensacola, Florida, and placed on waiting orders.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE-HOSPITAL SERVICE, FROM NOVEMBER 9 TO NOVEMBER 30, 1889.

FESSENDEN, C. S. D., *Surgeon.*—To inspect unserviceable property at Cincinnati, Ohio, November 18, 1889.

MURRAY, R. D., *Surgeon.*—Granted leave of absence for thirty days, November 30, 1889.

PURVIANCE, GEORGE, *Surgeon.*—Detailed as Chairman of the Board of Examiners, November 20, 1889.

GASSAWAY, J. M., *Surgeon.*—Granted leave of absence for twenty-nine days, November 13, 1889.

GODFREY, JOHN, *Surgeon.*—Detailed as member of the Board of Examiners, November, 1889.

IRWIN, FAIRFAX, *Surgeon.*—Detailed as Recorder of the Board of Examiners, November, 1889.

CARTER, H. R., *Passed Assistant Surgeon.*—Granted leave of absence for fifteen days, November 29, 1889.

NORMAN, SEATON, *Assistant Surgeon.*—Ordered to New York Marine Hospital, for temporary duty, November 21, 1889. To examination for promotion, November 22, 1889.

FATTIC, J. B., *Assistant Surgeon.*—Ordered to examination for promotion, November 22, 1889.

HEATH, F. C., *Assistant Surgeon.*—Ordered to examination for promotion, November 22, 1889.

MAGRUDER, G. M., *Assistant Surgeon.*—Ordered to examination for promotion, November 22, 1889. Granted leave of absence for twenty-seven days, November 29, 1889.

PERRY, T. B., *Assistant Surgeon.*—Granted leave of absence for twenty-five days, November 29, 1889.

COBB, J. O., *Assistant Surgeon.*—Granted leave of absence for thirty days, November 29, 1889.